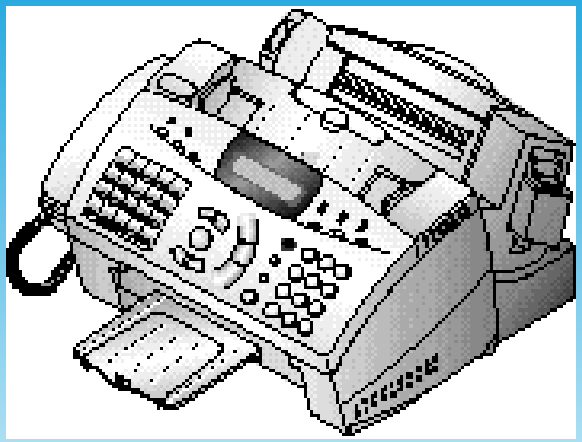
SAMSUNG

SF-4500/4500C
Msys4700/4800
MJ-4500C

SERVICE Manual

INKJET PRINTER COMPOUND



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ELECTRONICS

1. Precautions

Follow these safety, ESD, and servicing precautions to prevent personal injury and equipment damage.

1-1 Safety Precautions

1. Be sure that all built-in protective devices are in place. Restore any missing protective shields.

2. Make sure there are no cabinet openings through which people- particularly children- might insert fingers or objects and contact dangerous voltages.

3. When re-installing chassis and assemblies, be sure to restore all protective devices, including control knobs and compartment covers.

4. Design Alteration Warning:
   Never alter or add to the mechanical or electrical design of this equipment, such as auxiliary connectors, etc. Such alterations and modifications will void the manufacturer's warranty.

5. Components, parts, and wiring that appear to have overheated or are otherwise damaged should be replaced with parts which meet the original specifications. Always determine the cause of damage or overheating, and correct any potential hazards.

6. Observe the original lead dress, especially near sharp edges, AC, and high voltage power supplies. Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board.

7. Product Safety Notice:
   Some electrical and mechanical parts have special safety-related characteristics which might not be obvious from visual inspection. These safety features and the protection they provide could be lost if a replacement component differs from the original. This holds true, even though the replacement may be rated for higher voltage, wattage, etc.

   Components critical for safety are indicated in the parts list with symbols ⚠ ⚠. Use only replacement components that have the same ratings, especially for flame resistance and dielectric specifications. A replacement part that does not have the same safety characteristics as the original may create shock, fire, or other safety hazards.

1-2 ESD Precautions

Certain semiconductor devices can be easily damaged by static electricity. Such components are commonly called “Electrostatically Sensitive (ES) Devices”, or ESDs. Examples of typical ESDs are: integrated circuits, some field effect transistors, and semiconductor “chip” components.
The techniques outlined below should be followed to help reduce the incidence of component damage caused by static electricity.

CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

1. Immediately before handling a semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, employ a commercially available wrist strap device, which should be removed for your personal safety reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ESDs, place the assembly on a conductive surface, such as aluminum or copper foil, or conductive foam, to prevent electrostatic charge buildup in the vicinity of the assembly.

3. Use only a grounded tip soldering iron to solder or desolder ESDs.

4. Use only an “anti-static” solder removal device Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESDs.

5. Do not use Freon-propelled chemicals. When sprayed, these can generate electrical charges sufficient to damage ESDs.

6. Do not remove a replacement ESD from its protective packaging until immediately before installing it. Most replacement ESDs are packaged with all leads shorted together by conductive foam, aluminum foil, or a comparable conductive material.

7. Immediately before removing the protective shorting material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

8. Maintain continuous electrical contact between the ESD and the assembly into which it will be installed, until completely plugged or soldered into the circuit.

9. Minimize bodily motions when handling unpackaged replacement ESDs. Normal motions, such as the brushing together of
clothing fabric and lifting one’s foot from a carpeted floor, can generate static electricity sufficient to damage an ESD.

1-3 Lithium Battery Precautions

1. Exercise caution when replacing a Lithium battery. There could be a danger of explosion and subsequent operator injury and / or equipment damage if incorrectly installed.

2. Be sure to replace the battery with the same or equivalent type recommended by the manufacturer.

3. Lithium batteries contain toxic substances and should not be opened, crushed, or burned for disposal.

2. Specification

2-1 Printer Engine

Technology		Thermal Inkjet
		1-pen & Print Head Swapping Type
Speed	Color (*1)	3ppm at Draft Mode
	Mono (*2)	8ppm at Draft Mode
Resolution	Color	600 x 600 dpi (1200 x 1200 dpi Addressable)
	Mono	600 x 600 dpi (1200 x 1200 dpi Addressable)
Printing Width		203mm
Feeding Method	Automatic	130 Sheets of 20lb cut sheets
	Manual Tray	No
Emulation		Host Based Printing (GDI)
Printer Driver		Windows 3.1/3.11, Windows 95/98 driver
Interface		IEEE 1284 Compatible Parallel Interface (ECP)

(*1) The average printing time with 15% / A4 test image of Samsung.
(*2) The average printing time with 4% / A4 test image of Samsung.

2-2 Head

	Ink M-3	Ink C-3
Print Head	208 nozzles	192 nozzles
Ink type	Pigment	Dye
Ink Color	Black	Color
Ink Yield	about 600 sh.	about 200 sh.

2-3 Facsimile

GENERAL	Compatibility	ITU-G3
	Scan method	CIS
	Scan width	Max. 216mm, Effective: 210mm
	Scan Resolution	300 x 300 dpi
	Scan Speed	3 sec
	Feeding method	Sheet-fed
	ADF	30 sheets
	Guide	Document Input Guide
	Stacker	Document Output Stacker (No Paper Stacker)
	Paper Tray	BIN Type (No Manual Tray)
	Modem Speed	14.4 Kbps
	Coding Method	MH, MR, MMR, Error Correction Mode
	LCD	2 Lines Each of 16 Characters
SCANNING	Resolution	Selectable by 1-Key, 2-LEDs - Standard : 200 x 100 dpi - Fine : 200 x 200 dpi (Default) - Superfine : 300 x 300 dpi
	Gray Scale & Contrast	Selectable by 1-Key, 2-LEDs -Darken - Lighten - Photo : Error diffusion
MEMORY	Capacity (*3)	SF-4500/Msys4700 : 1.0 Mbyte (Factory Option : 3M) SF-4500C/Msys4800/MJ-4500C : 0.5 Mbyte (Factory Option : 2.5M)
	Back-up Time	30 Minutes (Continuous Power Failare)
	Confidential	No
	Delayed	Upto 30 Locations
	Group Dial	5 Number Programmable
	Forced Memory Tx.	Yes
	Priority Tx.	Yes
	Memory Rx.	Automatic reception when paper empty.

(*3) Monochromatic CCITT NO. 1 CHART can be saved by 80 sheets per 1.0M Byte.

2-3 Facsimile (continued)

TELEPHONE	One-touch Dial	20 Locations
	Speed Dial	50 Locations
	Chain Dial	Yes
	Handset & Cradle	Option
	On-hook Dial	Yes, 1-Key
	Last Number Redial	Yes, 1-Key
	Auto Busy Redial	Yes
	No Power Operation	UK : CALLING only, Other Country : No
	Hold & Mute	No
	Pause	Yes, Use Redial Key
	Ringer Volume	S/W Option Setting (4Steps)
	Tone/pulse Select	S/W Option setting (Pulse for NPO)
	Flash	UK : Yes, Other Country : No
	Mercury	No
	DRPD	US : Yes, Other Country : No
REPORT & LIST	TX/RX Journal	Yes
	Image TCR	Yes, Reduction of First Page Sent by Memory Tx
	Delayed Dial List	Yes
	System Data	Yes
	Tel Number List	Yes
	Help List	Yes
COPY	Multipage Copy	Upto 99 Pages
	Gray Scale	256 Levels
	Reduction & Enlargement	25%~200% (Reference is the top center of Document)
TEL I/F	Answering I/F	Yes
	Ext. Phone	1-jack, Extension Phone Transfer
OTHERS	Polling	Yes
	Sensors	No Paper, Paper Jam
	Error Indicator	1-LED
	Voice Request	Yes, On-hook Dial
	Real Time Clock	Yes
	RTI	Yes

2-4 Scanner

Compatibility	TWAIN
Technology	Platen CIS
Light Source for Color CIS	RGB LEDs (Line Order Control)

2-5 Power & Size

Power Source	USA : 110V 60 Hz, UK/GER : 220V 50 HZ
Dimensions (W x D x H)	360 x 325 x 190 mm (Without Handset)
Weight	5.7Kg

2-6 Accessaries

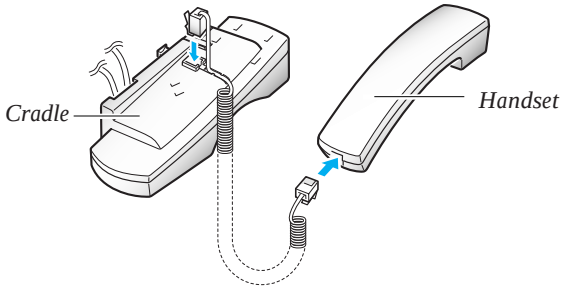
Tel	Handset / curlcord	1EA / 1EA
	Tel Line	1EA
Power Cord		1EA
Parrallel Cable		No
FAX Driver		2 Diskettes
Ink Cartridge		INK-M3 (MONO) 1EA (*4), INK-C3 (COLOR) 1EA (*4')
Manual		Yes
Carrier Sheet		Yes (*4)
Bundle S/W (one CD-ROM)	Contents (*5)	Electronic Manual, Prt Driver, Presto page manager, Smart_Fax, Photo Album, Twain Driver
	Supply	Default

(*4) SF-4500 / SF-4500C / Msys4700 / Msys4800 only
(*4') SF-4500C / MJ-4500C only
(*5) The smart_fax allows a on-screen remote control.

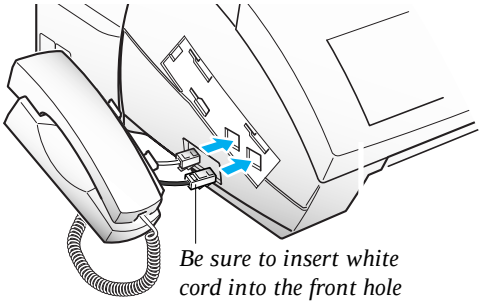
3. Installation

3-1 Handset and Handset Cradle

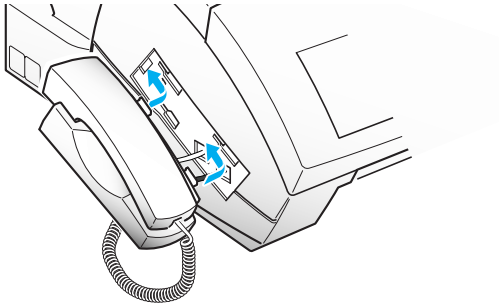
1. Plug one end of the coiled cord into the jack on the handset.



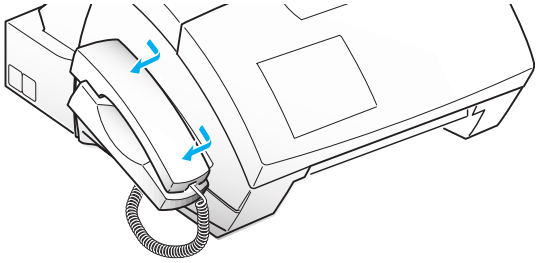
2. Plug the cradle's modular cords into the modular jacks on the left side of your machine.



3. Attach the handset cradle to the main body. Insert the two tabs of the cradle into the slots on the left side of the main body as shown, and push it up.

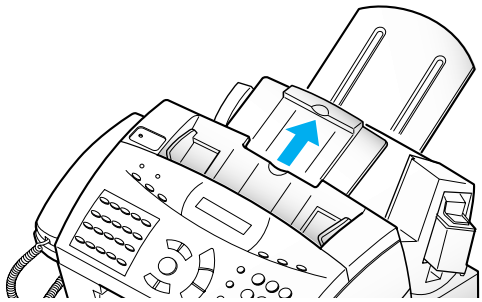


Note: If you want to remove the handset, slide it down, then take it out.

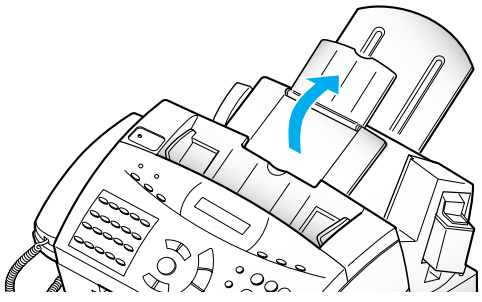


3-2 Document Tray

1. Pull the document tray upward.

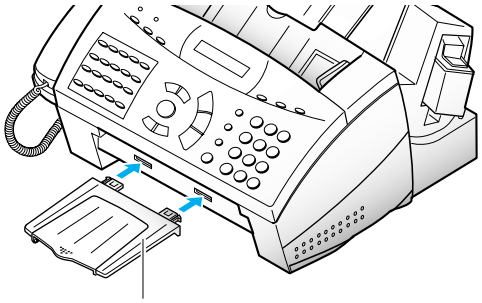


2. Fold out the extender on the document tray.



3-3 Document Exit Tray

1. Insert the two tabs on the document exit tray into the slots on the front of your machine.



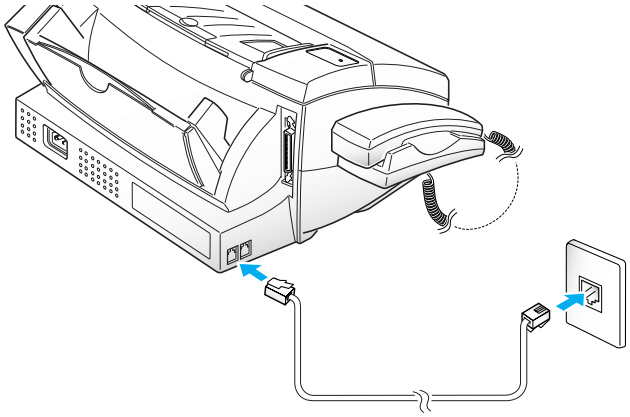
Document exit tray

2. Fold out the extender, if necessary.

Extender

3-4 Telephone Line

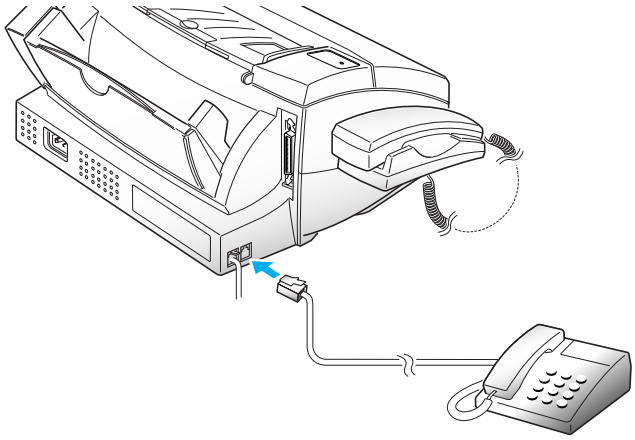
Plug one end of the telephone line cord into the TEL LINE jack and the other end into a standard phone wall jack.



3-5 Extension Phone (Optional)

Plug one end of the modular cord into the EXT.TEL jack on the back of your machine.

Plug the other end of the cord into a modular jack on a telephone answering device or a regular telephone to use as an extension.



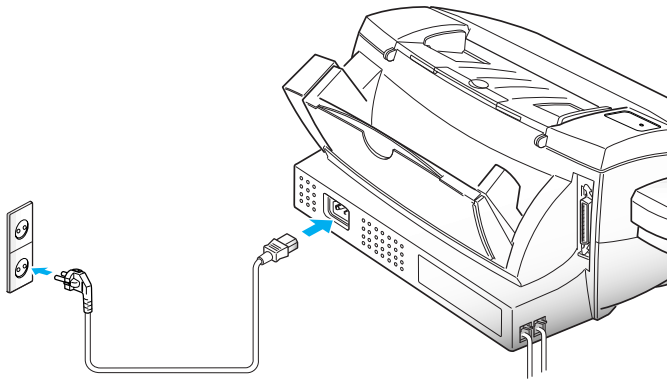
3-6 AC Power Cord

Plug one end of the cord into the back of the machine and the other end into a standard, grounded 3-prong AC power outlet.

The machine turns on. All lamps on the control panel light up and the LCD displays 'SYSTEM INITIAL' then 'PAPER OUT'. Load the paper as described on page 3-4.

If you want to turn it off, unplug the power cord.

Note : If documents are deleted from memory due to a power failure, the machine automatically prints out a Power failure report after power is supplied.



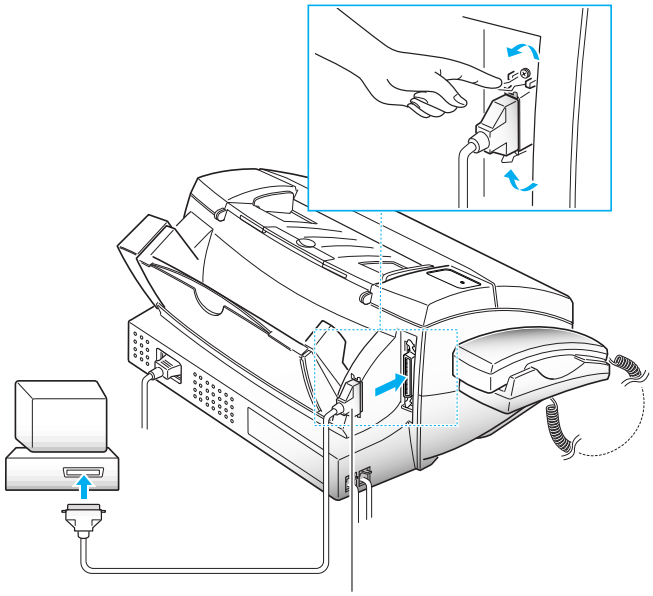
3-7 Connecting Printer Cable

1. Connect a bi-directional parallel printer cable to the 36 pin printer jack on your machine.

   It is recommended to use the parallel cable that supports IEEE-1284 bi-directional communications.

2. Fasten the metal clips to the parallel cable.

3. Connect the other end of the parallel cable to your computer.

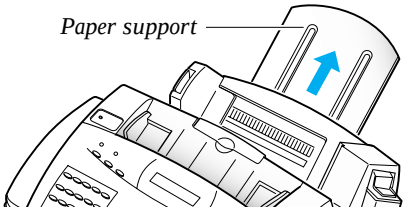


Printer cable

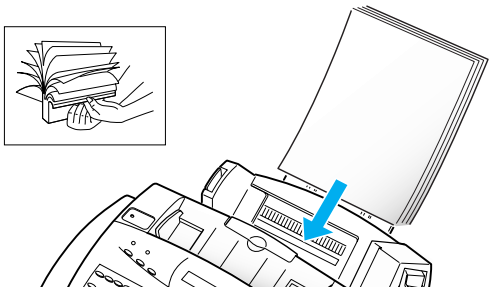
3-8 Loading Paper

The LCD displays 'PAPER OUT' when paper is not loaded. You can load approximately 130 sheets of paper.

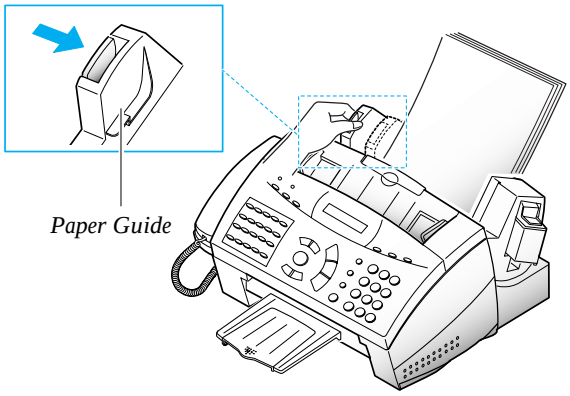
1. Pull the paper support on the paper bin all the way up.



2. Fan the paper and insert the paper with the print side facing you.



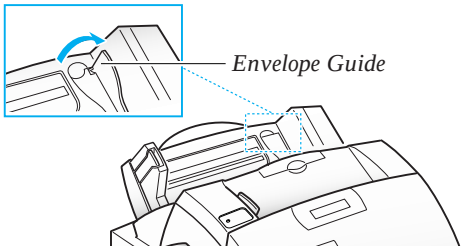
3. Hold the left paper guide and move it to the right to match the width of the paper.



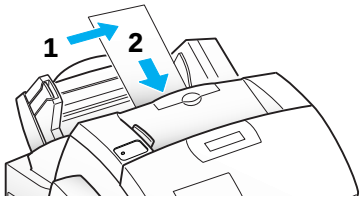
3-9 Loading an Envelope

You can load a standard or non-standard sized envelope.

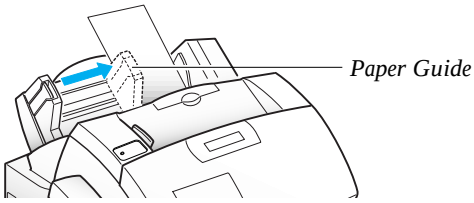
1. Turn the envelope guide upright.



2. Load the envelope and move it to the far right **1**. Then push it slightly down **2**. The right edge of the envelope must align with the raised edge of the envelope guide.



3. Slide the left paper guide to the right to match the width of the envelope.



Notes :

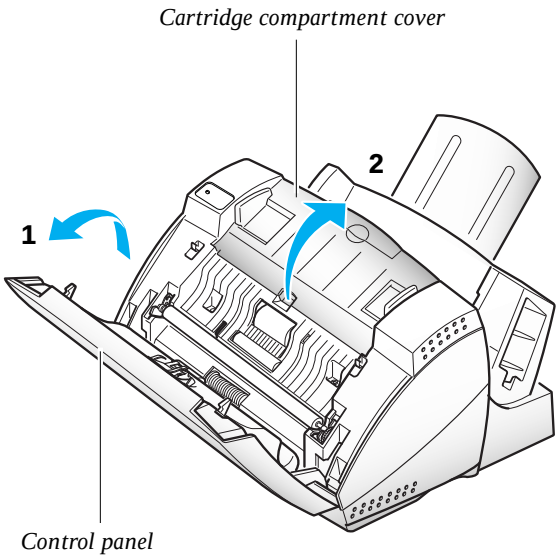
- If you remove the envelope after it is loaded, you must press the Form Feed button to load the envelope again.
- The acceptable width of the envelope is in the range of 98.5mm ~ 215.9mm.
- The envelope should be made of 20-24lb paper.

3-10-1 Print Cartridge

1. When you install a new print cartridge, press the **Cartridge** button on the control panel. The LCD displays 'CHECK CARTRIDGE! PLEASE INSTALL', and the print cartridge moves to the load position.

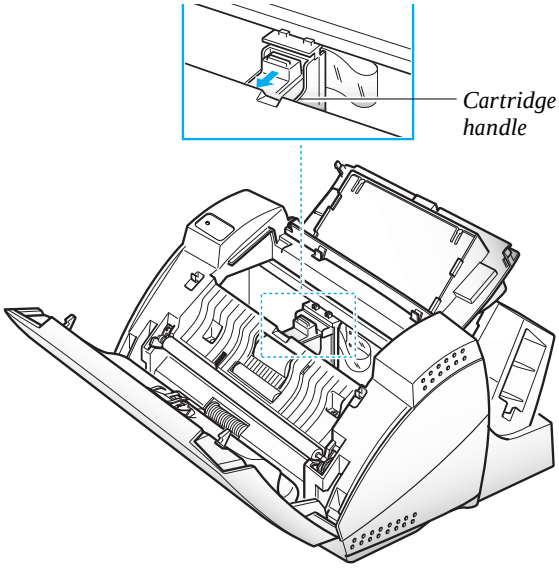
   If you install a color cartridge, use 'Install Cartridge' tab in the SF4400 Control Program on your PC.

2. Lift the control panel **1** with your hand and open the cartridge compartment cover **2**.

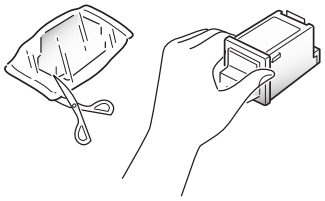


3. If you are replacing a used cartridge, remove the old cartridge.

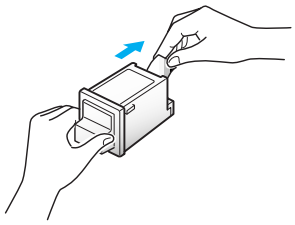
   Pull the print cartridge handle toward you until you hear a click, then remove the print cartridge.



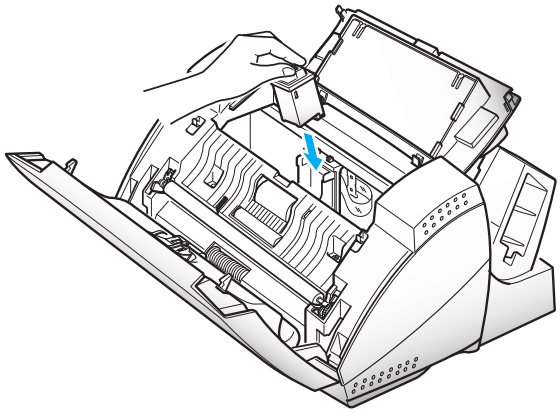
4. Remove the new print cartridge from its packaging. Hold the print cartridge by the black areas or colored top only. Do not touch the copper area.



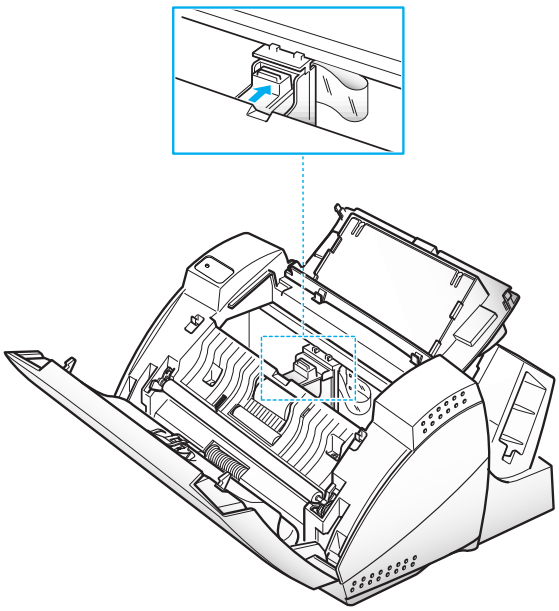
5. Carefully remove the tape covering the printhead. Be sure to remove all the tape.



6. Insert the print cartridge in the carrier.



7. Push the cartridge firmly in the direction of the arrow until it clicks into place.



8. After installing the print cartridge, close the cover and replace the control panel.

9. Use 'Install Cartridge' tab on your PC for a color cartridge.

   The LCD displays 'THE CARTRIDGE IS 1:NEW 2:USED'.

10. Choose '1:NEW' by using the **F** or **E** button, or by pressing the 1 button.

11. Press the **Cartridge** button. The LCD displays briefly 'MONO INSTALLED' (or 'COLOR INSTALLED' for color print cartridge).

    Use 'Install Cartridge' tab on your PC for a color cartridge.

    If the cartridge is not installed properly, the LCD displays 'CHECK CARTRIDGE! PLEASE INSTALL'. Remove the cartridge and re-insert it.

Notes :

- When you install a new cartridge, you must choose '1:NEW.' When you install a used cartridge, select '2:USED', which helps you check the amount of ink remaining. If you mix up several used cartridges, it will be difficult to check the amount of ink remaining. Once a new print cartridge is installed, use it until it has completely run out of.
- If you want to install a color cartridge to print a file from your PC, you should use 'Install Cartridge' tab in the SF4500 Control Program on your PC. If you use the Cartridge button on this machine, the machine beeps a warning tone and briefly displays 'RE-INSTALL COLOR USING PC-DRIVER'. Press 'Install Cartridge' tab on your PC, or the file may print using composite black.

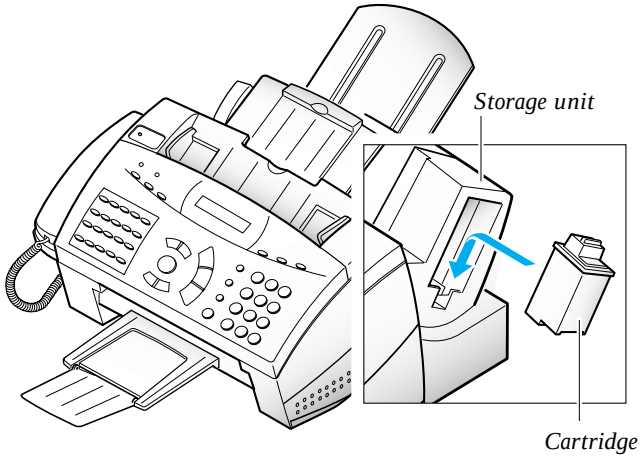
3-10-2 Print Cartridge Storage Unit

The print cartridge storage unit provides a convenient place to store an extra black or color print cartridge, and prevents an opened cartridge from drying out.

TO STORE A PRINT CARTRIDGE IN THE STORAGE UNIT

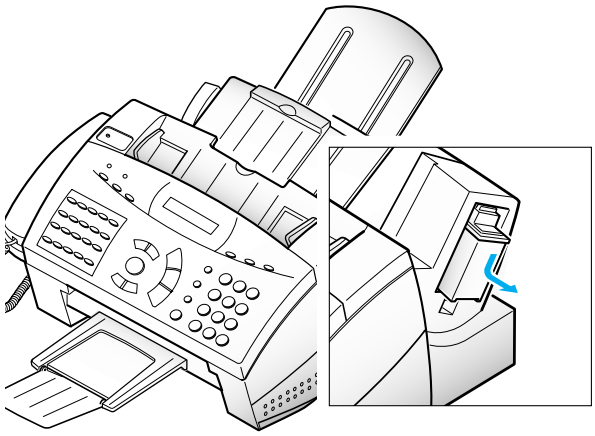
Insert the print cartridge into the storage unit and slightly push it down.

When switching between the color and black print cartridges, keep the unused one in the print cartridge storage unit. The storage unit prevents the print cartridge from drying out while providing easy access to it.



TO REMOVE A PRINT CARTRIDGE FROM THE STORAGE UNIT

Push the cartridge slightly down and pull it toward you.



4. Disassembly and Reassembly

4-1 General Precautions on Disassembly

When you disassemble and reassemble components, you must use extreme caution. The close proximity of cables to moving parts makes proper routing a must. If components are removed or replaced, any cables disturbed by the procedure must be replaced as close as possible to their original positions. Before removing any component from the machine, note the cable routing that will be affected.

Whenever servicing the machine, you must perform as follows:

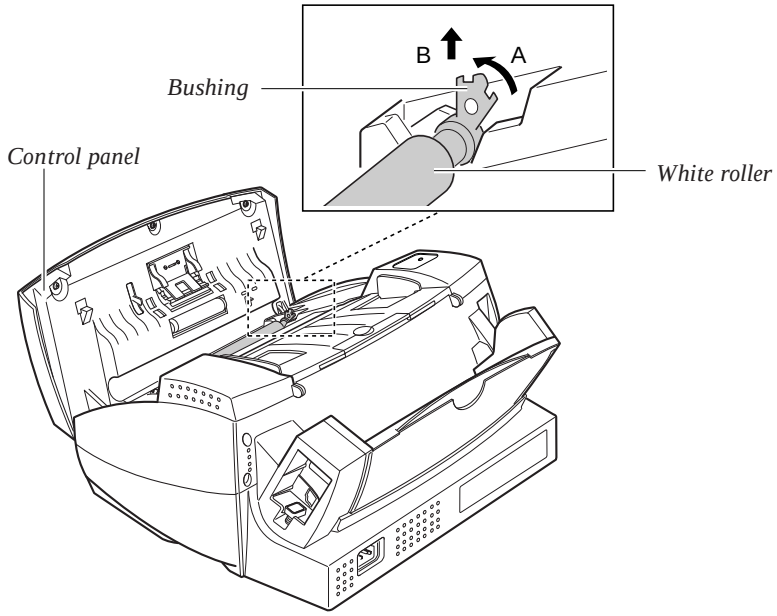
1. Check to verify that documents are not stored in memory.
2. Move the printer cartridge to far right to cap the nozzle.
3. Unplug the power cord.
4. Use a flat and clean surface.
5. Replace only with authorized components.
6. Do not force plastic-material components.
7. Make sure all components are in their proper position.

4-2 White Roller Ass'y

1. Lift the control panel using hand.

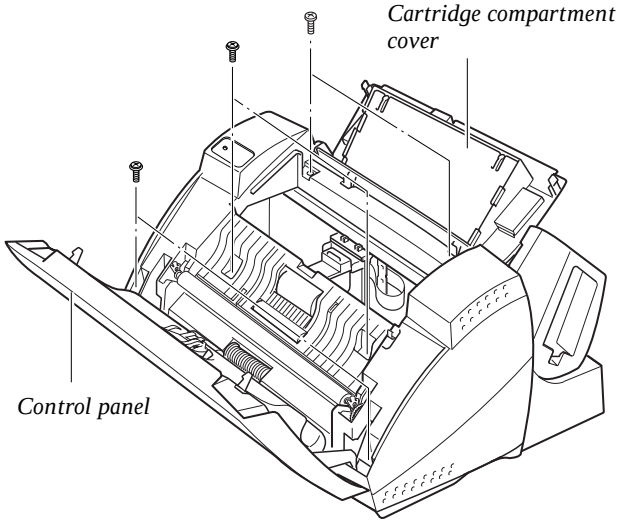
2. Push the bushing on both ends of the roller slightly inward, then rotate it until it reaches the slot as shown below. Then lift the roller out.

Note : Check the roller for any dirt. If dirty, wipe it off with soft cloth dampened with water. If the roller is heavily worn, replace it with a new one.

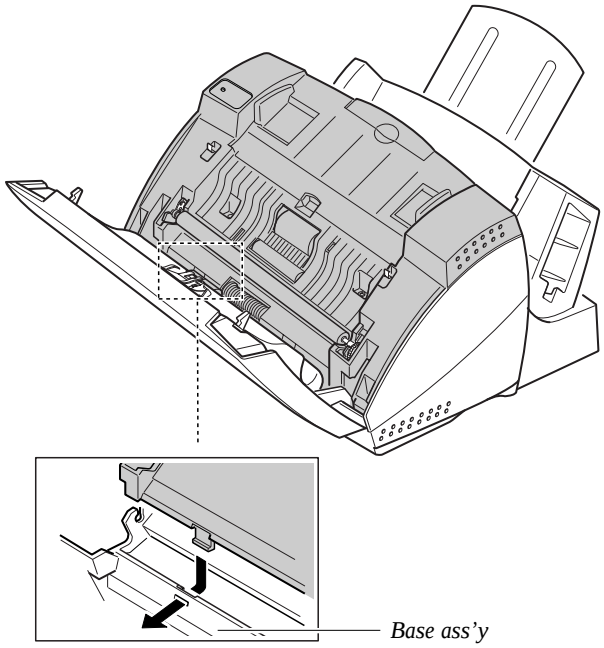


4-3 Top Cover Ass'y

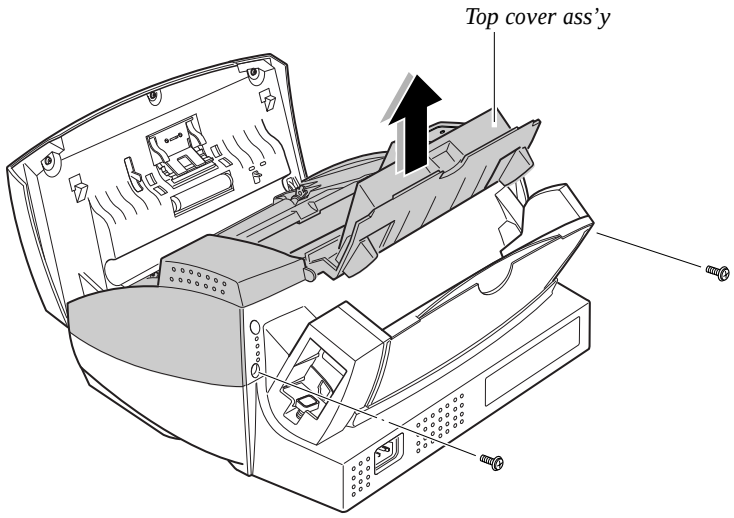
1. Lift the control panel and open the print cartridge compartment cover. Remove the white roller ass'y. Remove the six screws shown below.



Note: When you reassemble the top cover ass'y, make sure the tabs in the bottom of the ass'y fit into the slots in the base ass'y.

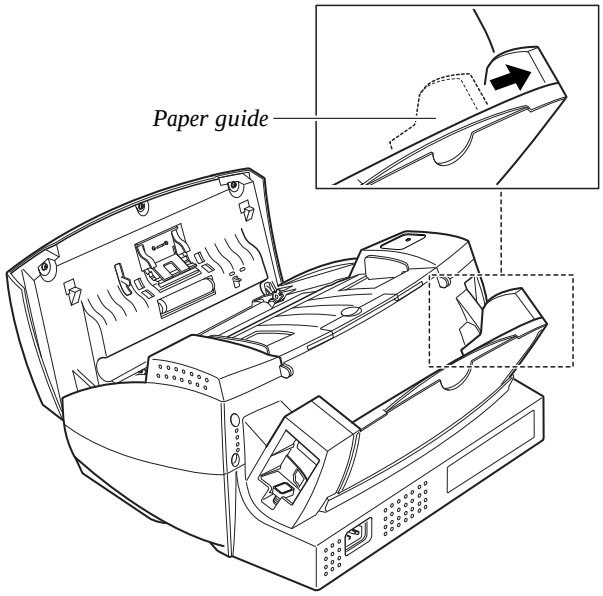


2. Remove the print cartridge. Remove the two screws shown below and take out the top cover ass'y.

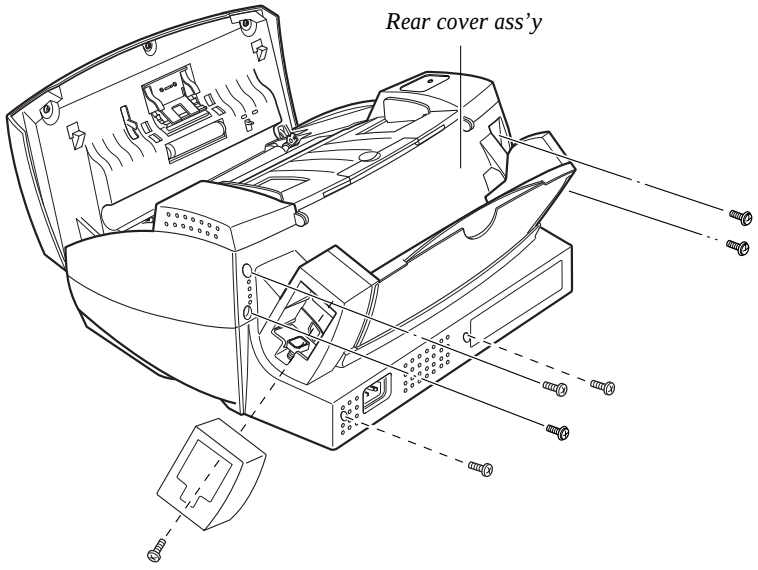


4-4 Rear Cover Ass'y

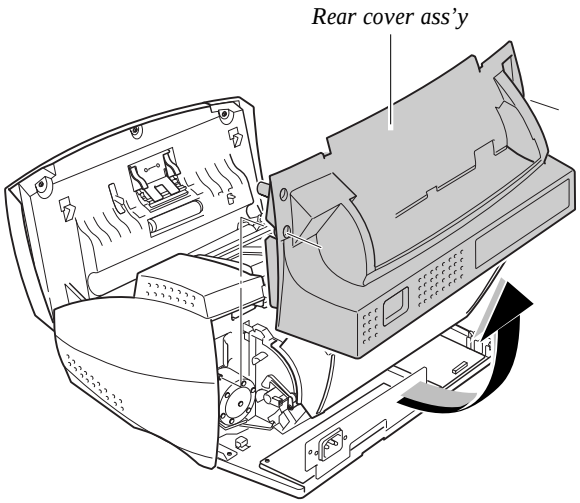
1. Holding the paper guide, move it in the direction of arrow.



2. Remove the storage Unit, and remove the six screws shown below.



3. Holding the rear cover ass'y, take it out by rotating it to be released properly.



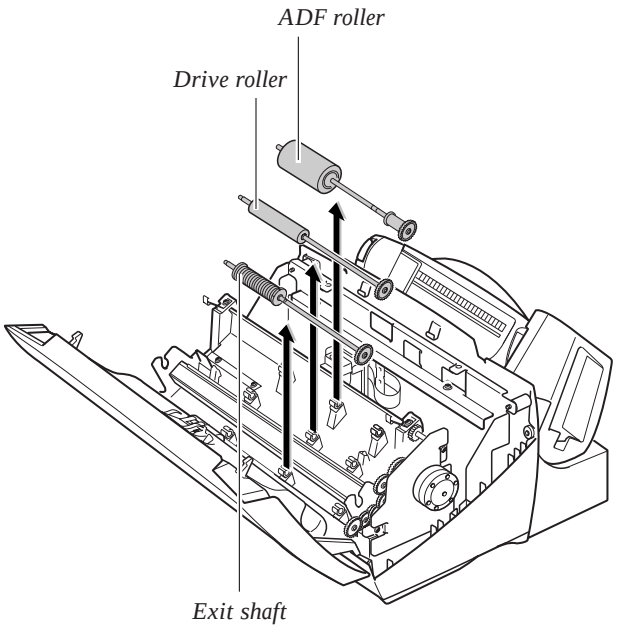
4-5 Base Ass'y

4-5-1 Rollers (ADF Roller, Drive Roller, Exit Shaft)

1. Before you disassemble the rollers, you should remove:

   – Top Cover Ass'y (see page 4-2)

2. Take out the rollers from the base ass'y.



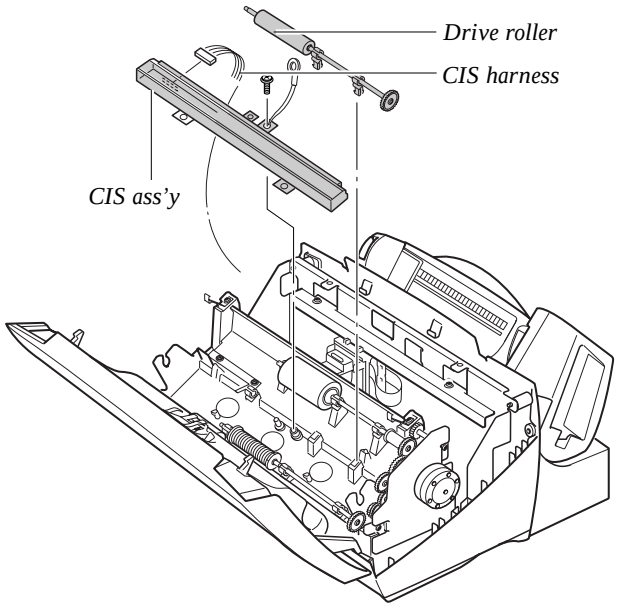
Note : Clean the surface of the rollers with ethyl alcohol. After wiping them, you must dry them completely.

4-5-2 CIS (Contact Image Sensor)

1. Before you disassemble the CIS, you should remove:
   – Top Cover Ass'y (see page 4-2)

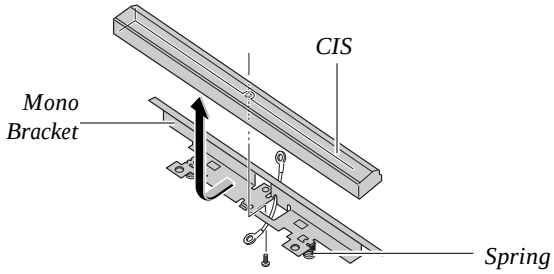
2. Remove the drive roller as described in '4-5-1 Rollers'.

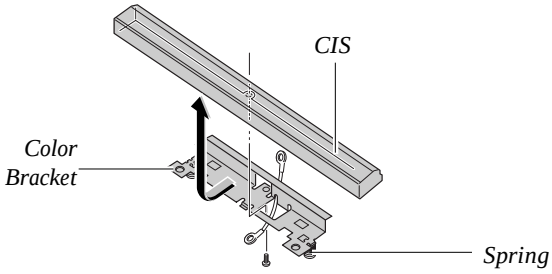
3. Remove the one screw securing the CIS ass'y and unplug the CIS harness. Take out the CIS ass'y.



4. Turn the CIS ass'y over. Remove the one screw to release the CIS from the bracket.

Note: Be careful not to lose the springs.





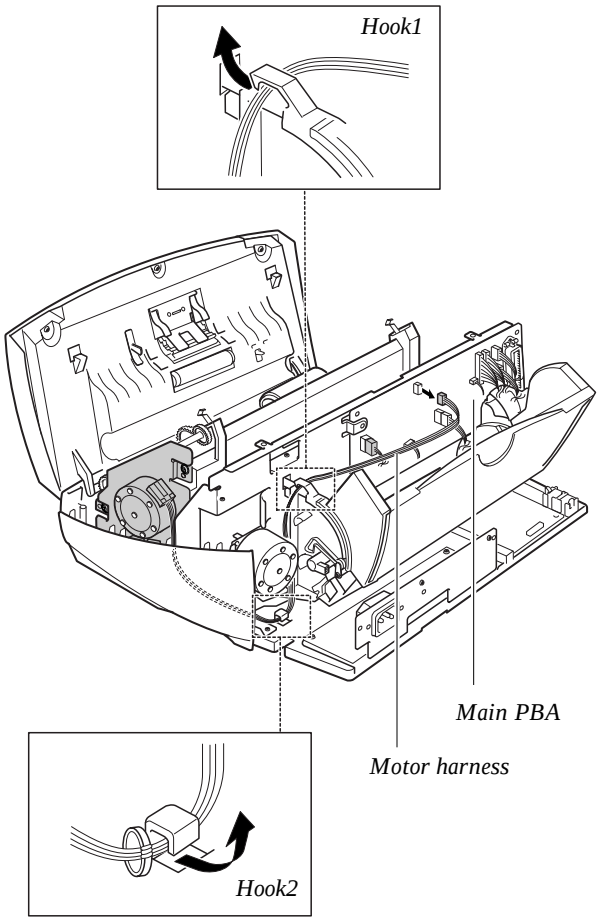
Note : Check the glassy surface of the CIS for any stain or scratch. If stained, wipe off with ethyl alcohol. If it is heavily stained or scratched, replace it with a new one.

Note : There is a little difference mono bracket and color bracket.

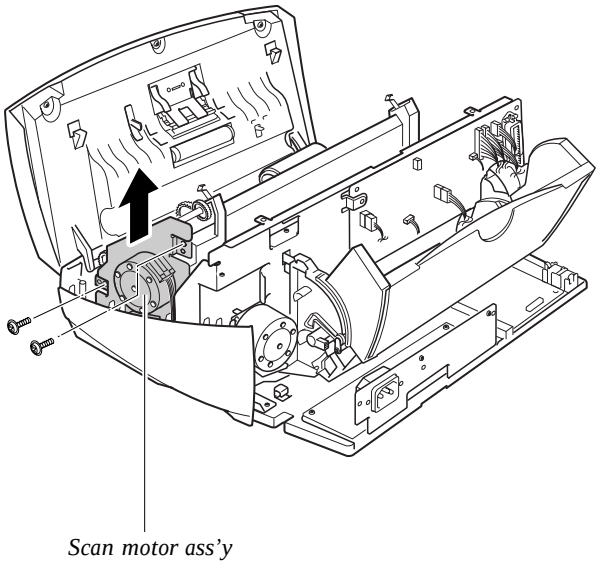
4-5-3 Scan Motor

1. Before you disassemble the CIS, you should remove:
   – Top Cover Ass'y (see page 4-2)
   – Rear Cover Ass'y (see page 4-3)

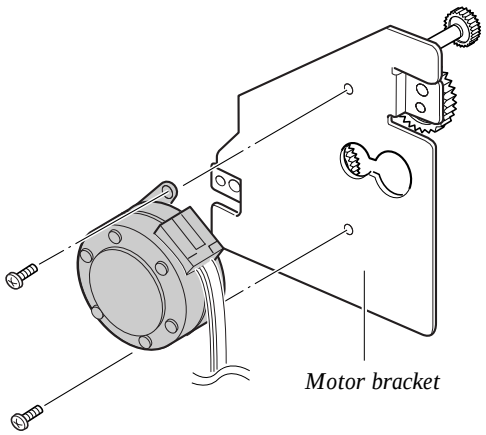
2. Unplug the motor connector from the main PBA. Make sure the harness is released from two hooks securing the harness as shown below.



3. Remove the two screws as shown below and take out the scan motor ass'y.



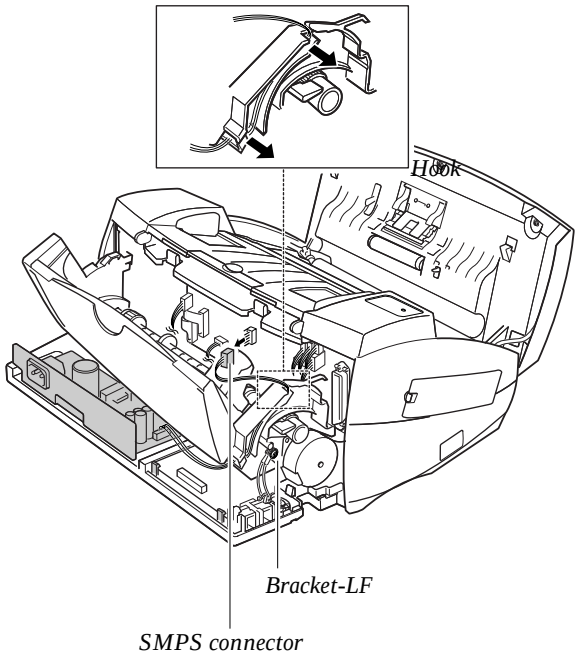
4. Remove the two screws securing the motor to the motor bracket.



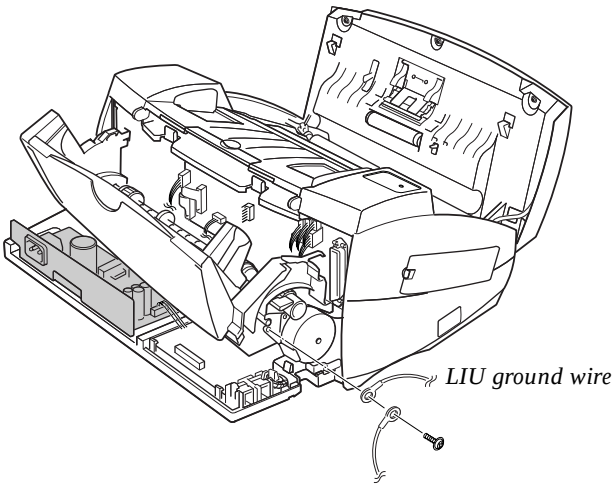
4-5-4 SMPS

1. Before you disassemble the SMPS, you should remove:
   – Rear Cover Ass'y (see page 4-3)

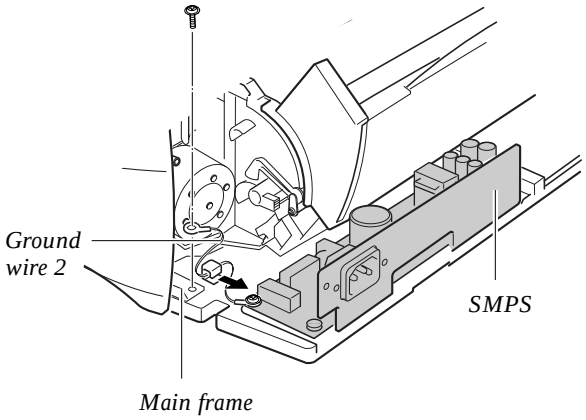
2. Unplug the SMPS connector from the Main PBA. Make sure the harness is released from the hook as shown below.



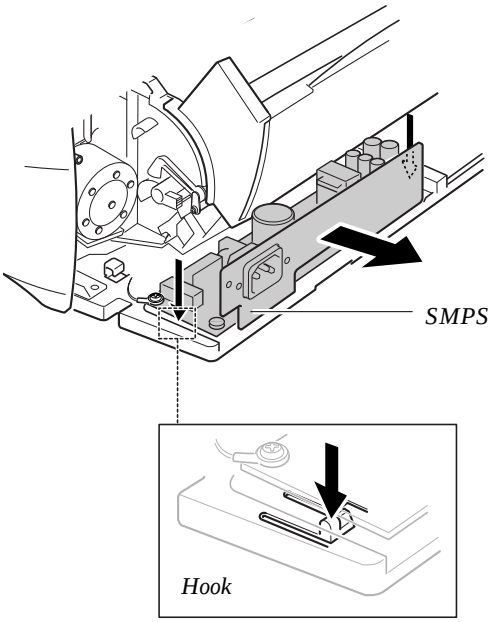
3. Remove the one screw securing the ground wires to the bracket as shown.



4. Remove the one screw securing the ground wire to the main frame as shown. Make sure the harness is released from the hook securing as shown below.



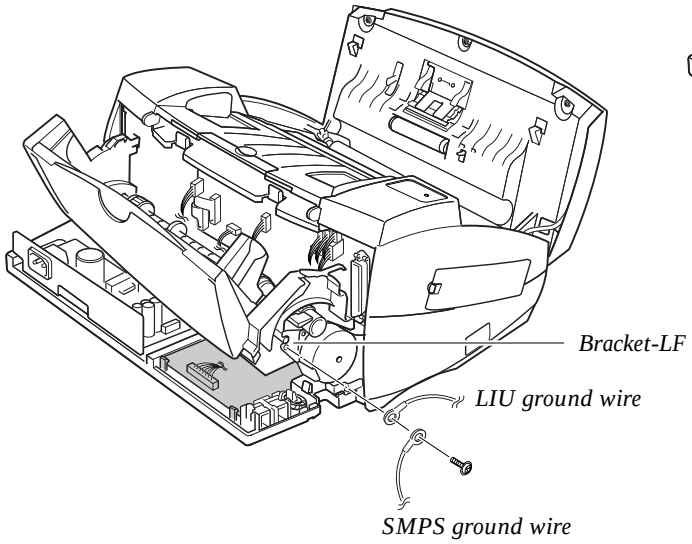
5. Pushing down the hooks on both ends, pull out the SMPS.



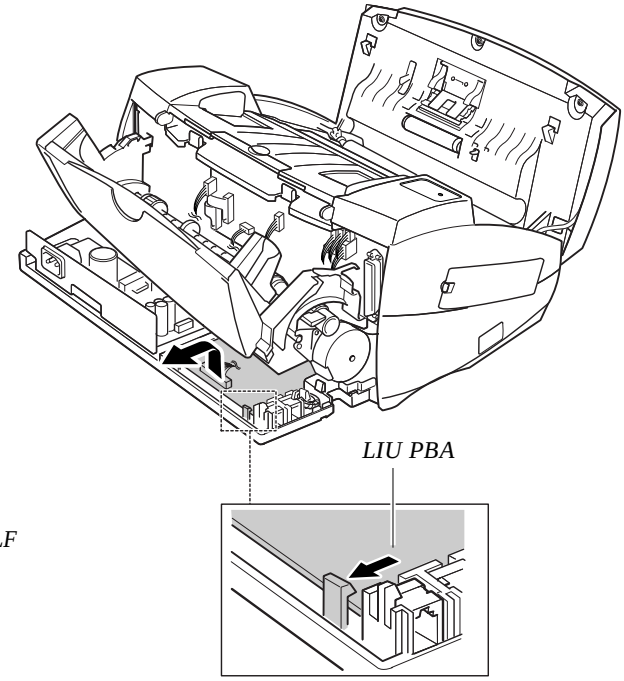
4-5-5 LIU PBA

1. Before you disassemble the LIU PBA, you should remove:
   – Rear Cover Ass'y (see page 4-3)

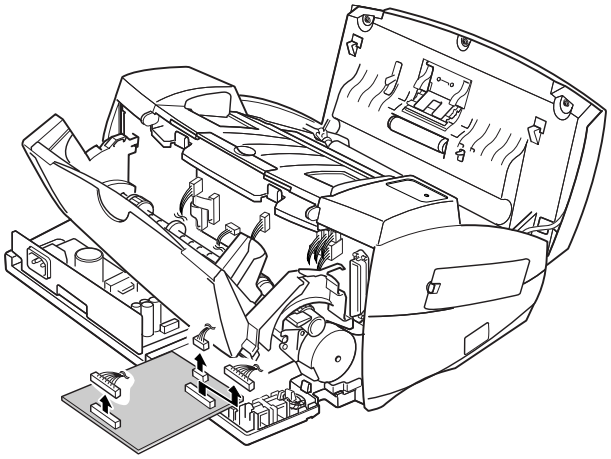
2. Remove the one screw securing the ground wires to the bracket.



3. Pulling the snap fits locking the PBA outward, push up the LIU PBA.



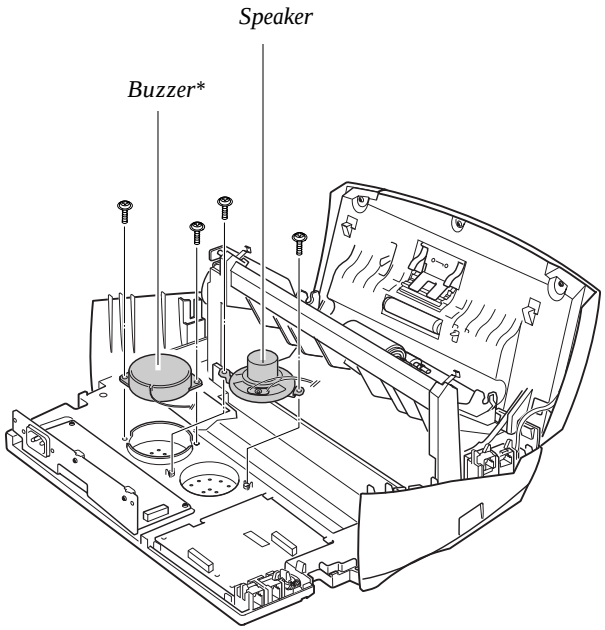
4. Unplug all the connectors from the LIU PBA.



4-5-6 Speaker and Buzzer*

1. Before you disassemble the speaker and buzzer, you should remove:
   – Printer Unit (see page 4-11)

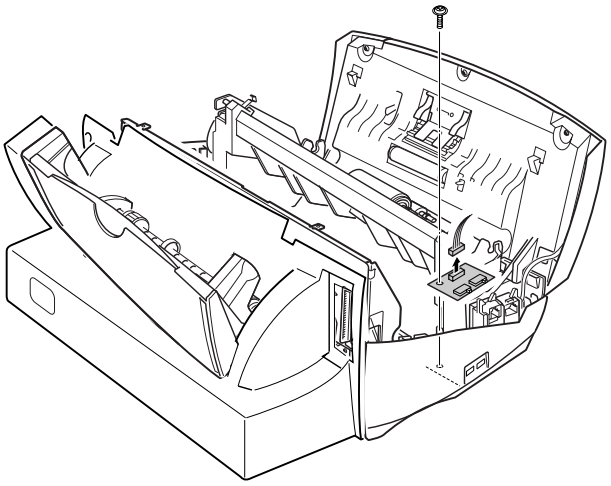
2. Remove the four screws securing the speaker and buzzer.



4-5-7 Volume PBA

1. Before you disassemble the Volume PBA, you should remove:
   – Top Cover Ass'y (see page 4-2)

2. Unplug the one connector and remove the one screw shown below, and take out the PBA.



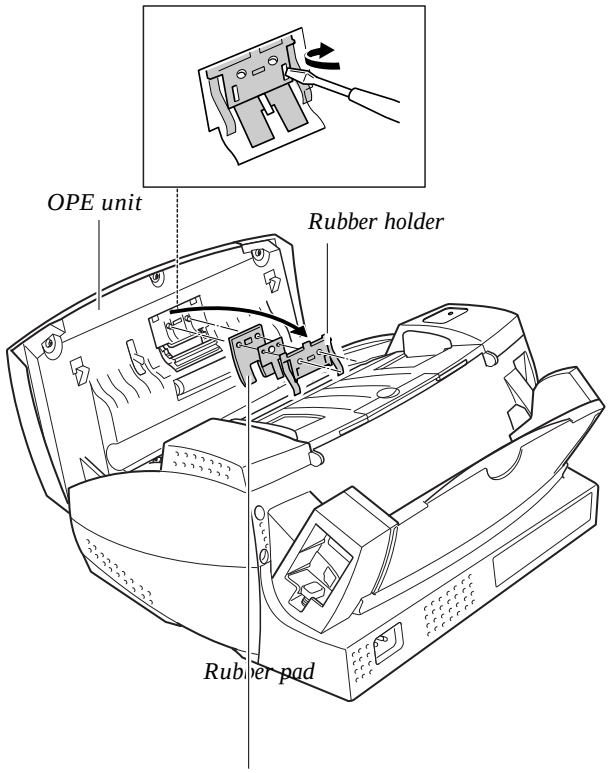
*Optional

4-6 OPE Ass'y

4-6-1 ADF Rubber Pad

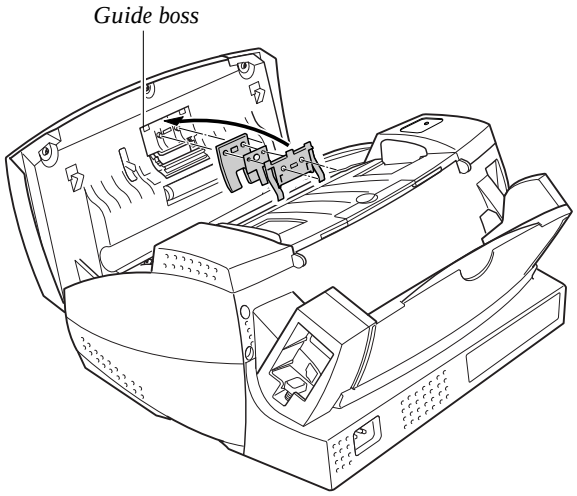
1. Open the OPE unit.

2. Insert a flat blade screw driver into the slot as shown below, and release the latches. Take out the rubber holder, sheet ADF and the rubber pad.



Notes:

- When you reassemble the rubber pad, be sure that the rubber pad, sheet ADF and holder fit into the guide boss and the holder latches fit into the corresponding hole. Then push firmly until it clicks.



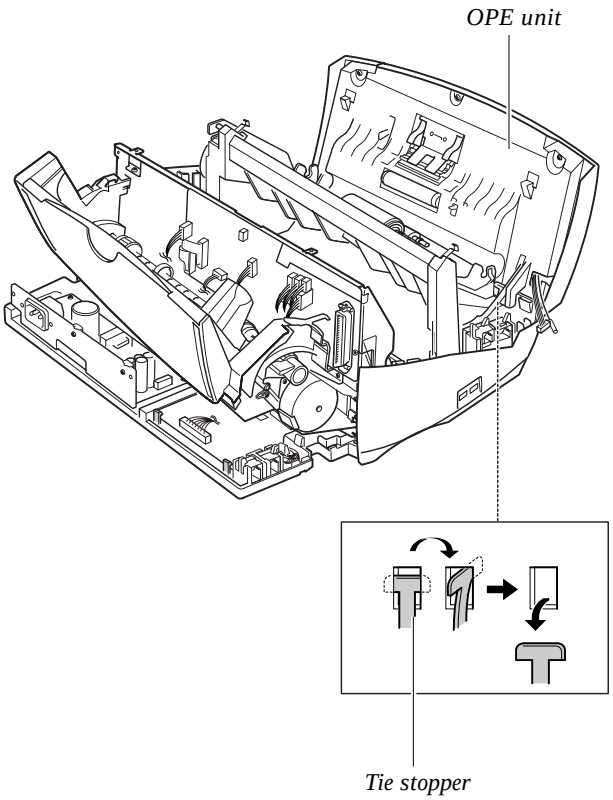
- Clean the surface of the rubber pad with ethyl alcohol. After wiping it, be sure to dry it.
  Check the rubber wear. If the wear reaches 1/2 its original thickness, replace it with a new one.

4-6-2 OPE Unit

1. Before you disassemble the OPE unit, you should remove:
   – Top Cover Ass'y (see page 4-2)
   – Rear Cover Ass'y (see page 4-4)

2. Unplug the OPE (NPO) connector from the LIU PBA.

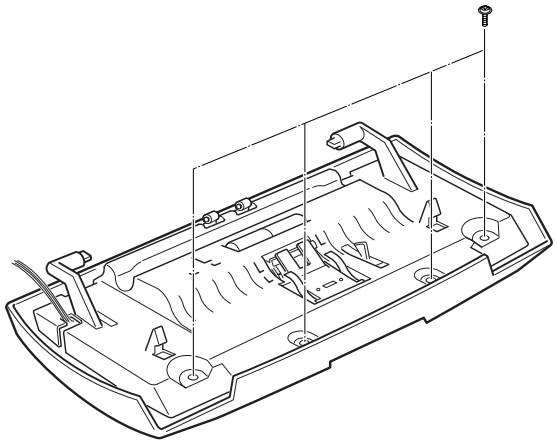
3. Turn the tie stopper 90 degrees as shown below and take out the OPE unit.



4-6-3 Roll Pinch

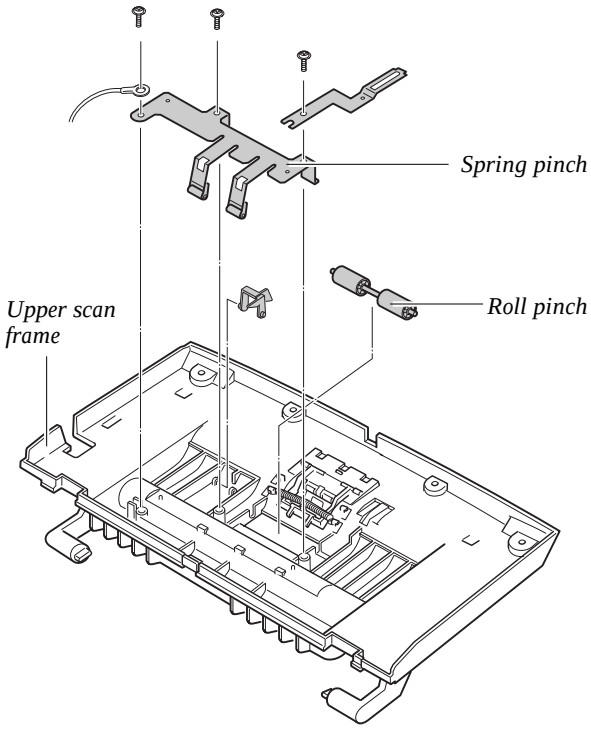
1. Before you disassemble the roll pinch, you should remove:
   – OPE Unit (see page 4-9)

2. Remove the four screws securing the OPE unit.



3. Turn the upper scan frame of the OPE unit over.

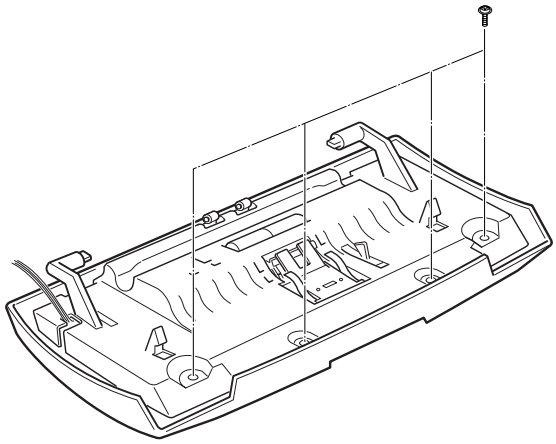
4. Remove the three screws and take out the spring pinch. Then take out the roll pinch.



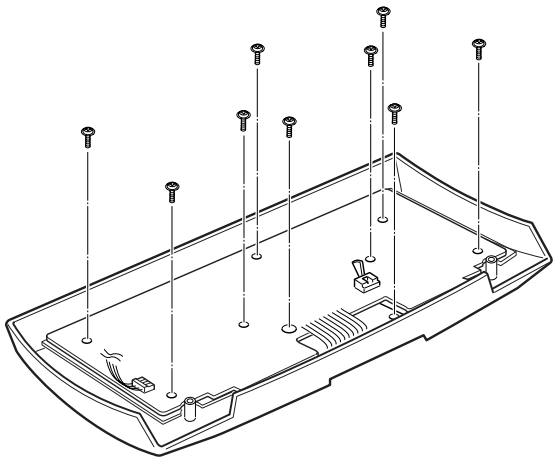
4-6-4 OPE PBA

1. Before you disassemble the OPE PBA, you should remove:
   – OPE Unit (see page 4-9)

2. Remove the four screws securing the OPE unit.



3. Remove the nine screws and take out the PBA and LCD.



Notes:

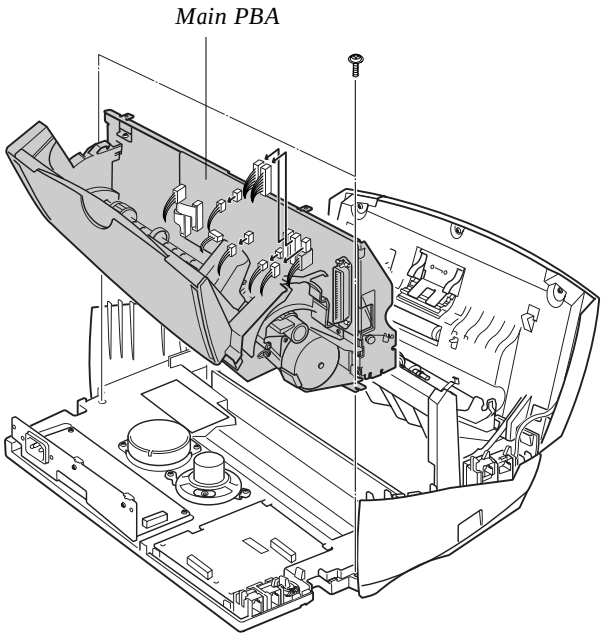
- Do not turn the OPE unit upside down after you remove the screws securing the PBA. Keys and rubber contacts may be separated and easily lost.
- When you reassemble the OPE unit, make sure the keys are in correct position.
- When you reassemble the PBA, secure the screws according in the order of the number printed on the PBA.
- After reassembling, operate the machine to make sure it works properly.
- After reassembling, make sure the LCD is not blocked.

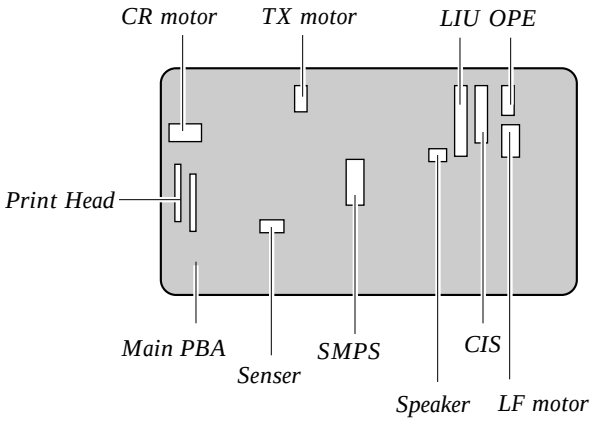
4-7 Printer Ass'y

4-7-1 Printer Unit

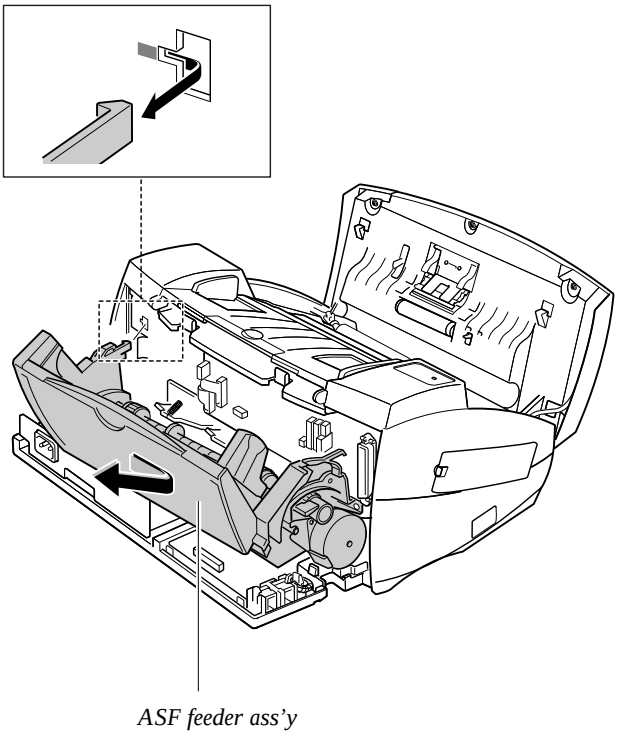
1. Before you disassemble the printer unit, you should remove:
   – Top Cover Ass'y (see page 4-2)
   – Rear Cover Ass'y (see page 4-3)

2. Remove the two screws securing the printer unit, and unplug the six connectors from the Main PBA. Take out the printer unit.





3. Remove the ASF feeder ass'y from the printer unit by pushing the tab inward and take the ass'y out in the direction of arrow.

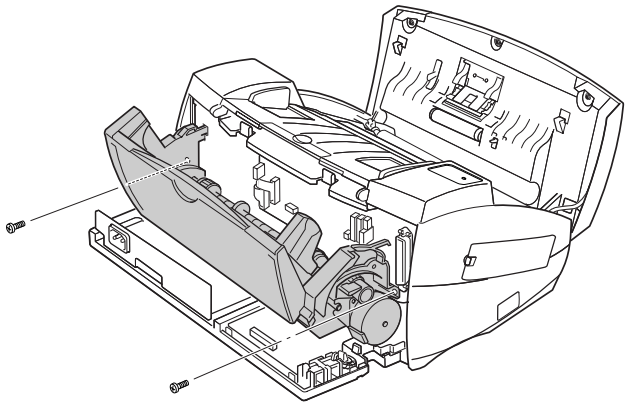


Note: When you reassemble the unit, do not pinch or short the wire harness.

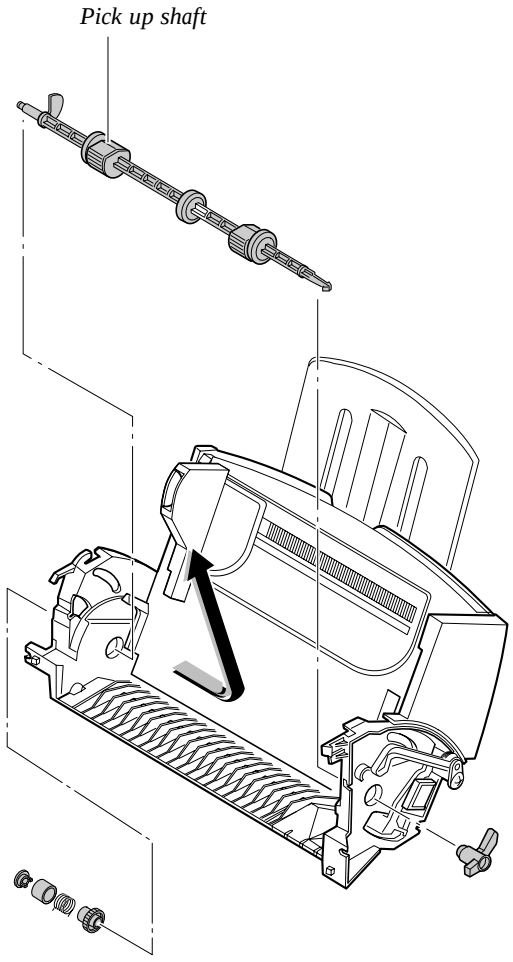
4-7-2 ASF Feeder Ass'y

1. Before you disassemble the ASF feeder ass'y, you should remove:
   – Rear Cover Ass'y (see page 4-3)

2. Unplug all connectors from the Main PBA and remove the two screws shown below.



4. Remove the one screw, then remove pick up shaft from the ASF frame while pushing it to the right to disengage the gear.

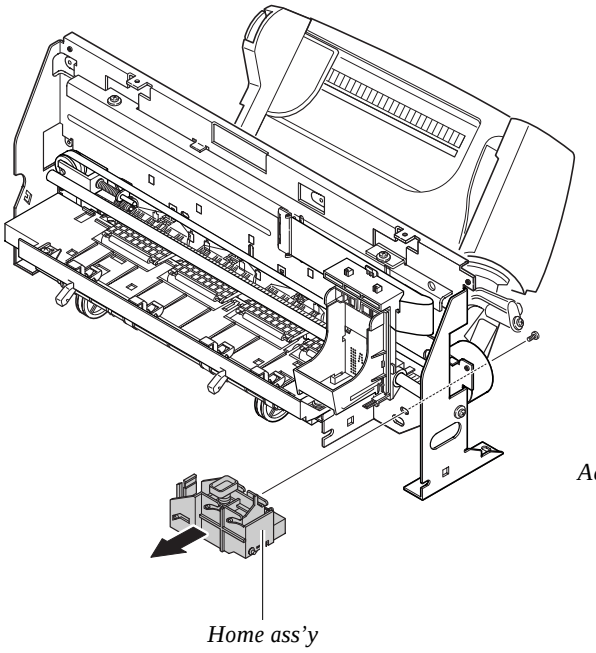


Note : When you reassemble the ASF feeder ass'y, insure the harness in the line feed motor is not pinched or shorted.

4-7-3 Home Ass'y

1. Before you disassemble the home ass'y, you should remove:
   – Printer Unit (see page 4-11)

2. Pushing the both ends of the home ass'y, take out the ass'y in the direction of arrow.

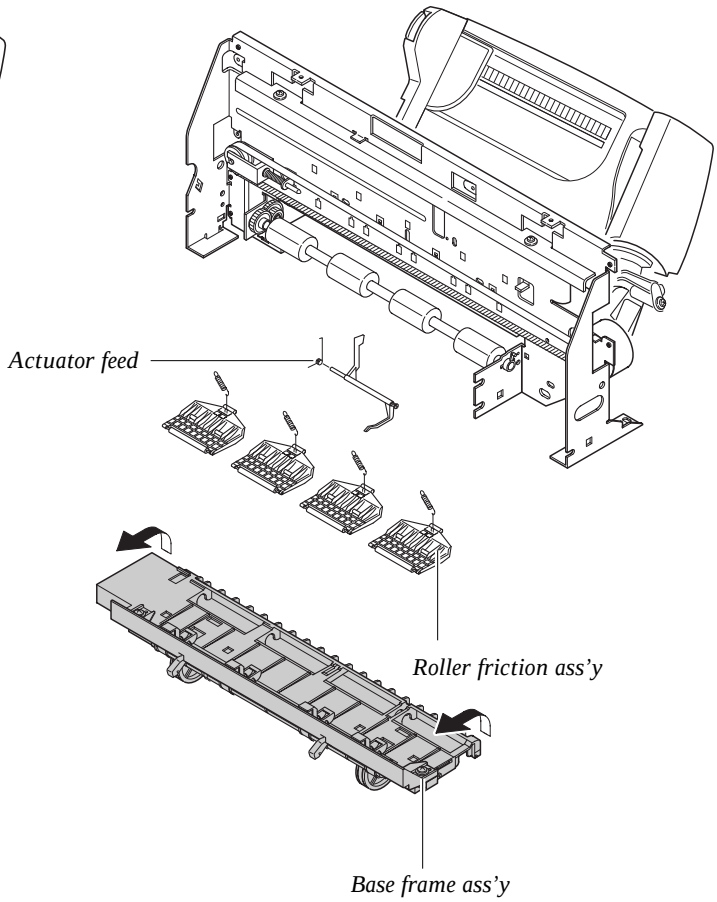


4-7-5 Base Frame Ass'y

1. Before you disassemble the base frame ass'y, you should remove:
   – Printer Unit (see page 4-11)
   – Carrier Ass'y

2. Remove the friction ass'y, then take out the actuator feed.

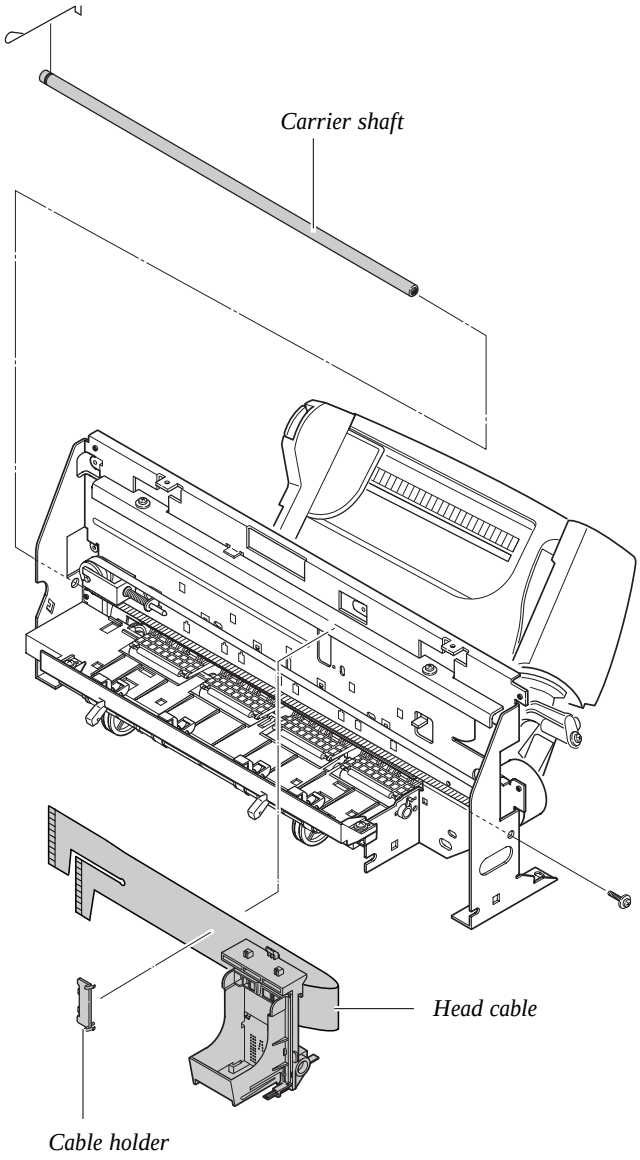
3. Pull out the base frame ass'y.



4-7-4 Carrier Ass'y

1. Before you disassemble the carrier ass'y, you should remove:
   – Printer Unit (see page 4-11)

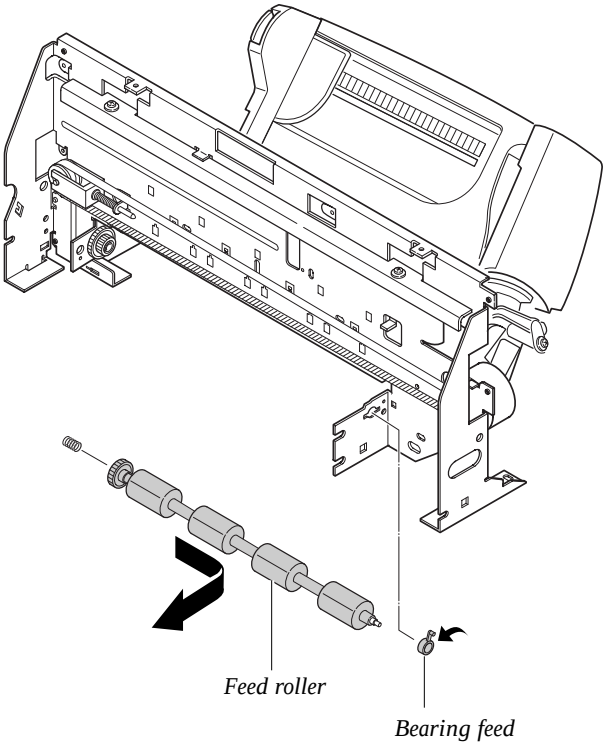
2. Remove the cable holder. Remove the one screw on the right side of the main frame, and remove the spring. Then take out the carrier shaft.



4-7-6 Feed Roller Ass'y

1. Before you disassemble the feeder roller ass'y, you should remove:
   – Printer Unit (see page 4-11)
   – Carrier Ass'y
   – Base Frame Ass'y

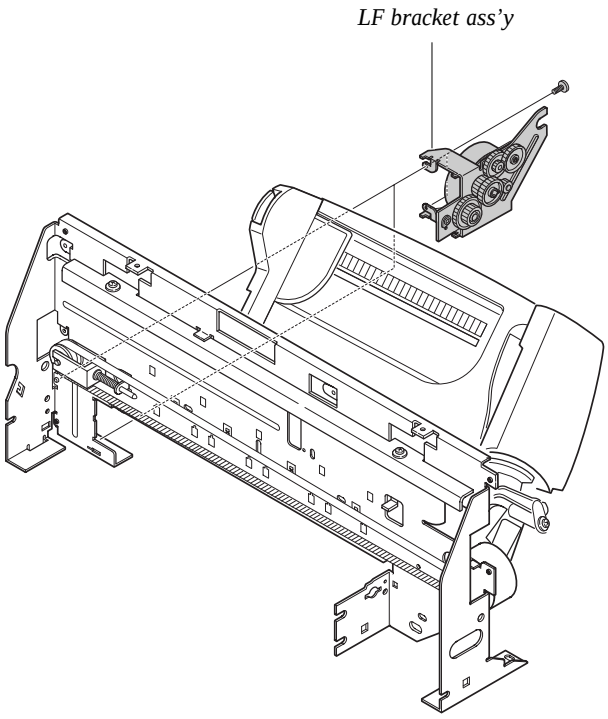
2. Remove the bearing feed from the main frame. Pull the feeder roller in the direction of arrow and take it out.



4-7-7 Line Feeder Bracket Ass'y

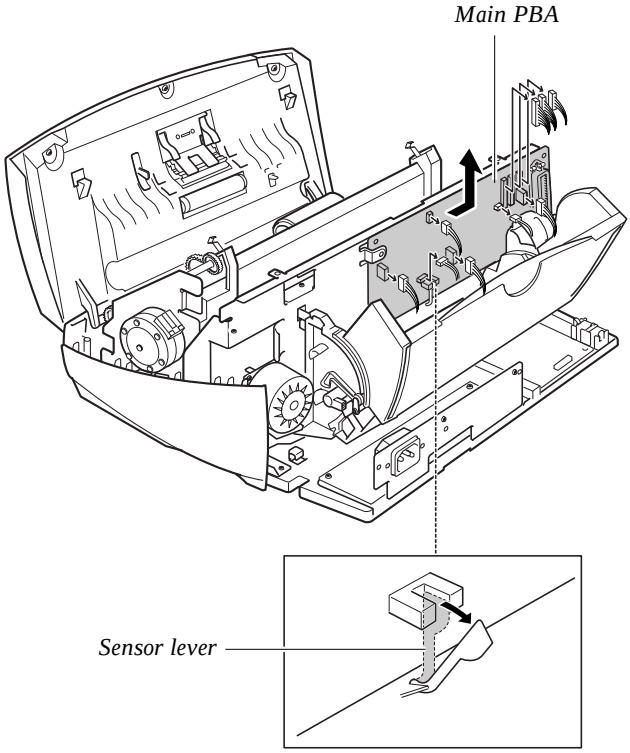
1. Before you disassemble the line feeder bracket ass'y, you should remove:
   – Printer Unit (see page 4-11)
   – Feeder Roller Ass'y (see page 4-12)

2. Remove the two screws and take out the LF bracket ass'y.



3. Unplug all connectors from the Main PBA.

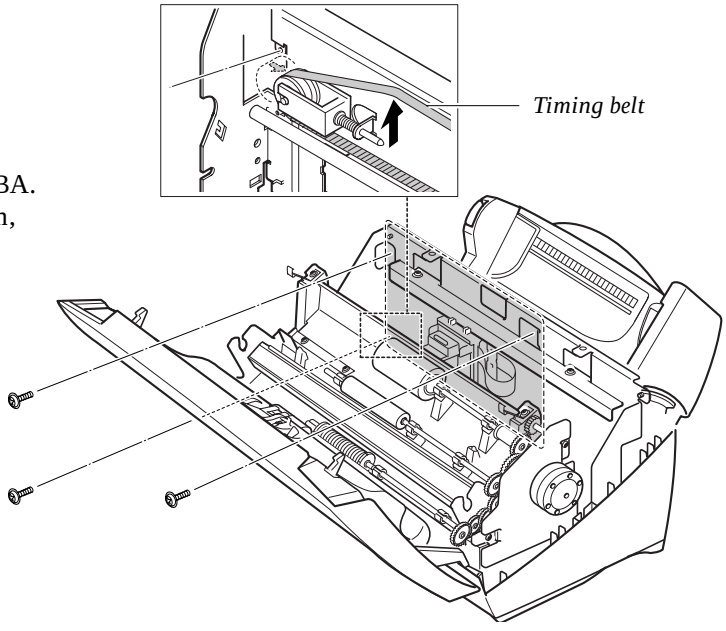
4. Pull the sensor lever towards you and take out the Main PBA.



4-7-8 Main PBA

1. Before you disassemble the Main PBA, you should remove:
   – Top Cover Ass'y (see page 4-2)
   – Rear Cover Ass'y (see page 4-3)

2. Remove the three screws securing the Main PBA. When you remove the one screw at the bottom, pull the timing belt.



6. Circuit

6-1 Main PBA

6-1-1 Summary

The main circuit that consists of CPU, MFP controller (built-in 32bit RISC processor core: ARM7TDMI) including various I/O device drivers, system memory, scanner, printer, motor driver, PC I/F, and FAX transceiver controls the whole system. The entire structure of the main circuit is as follows:

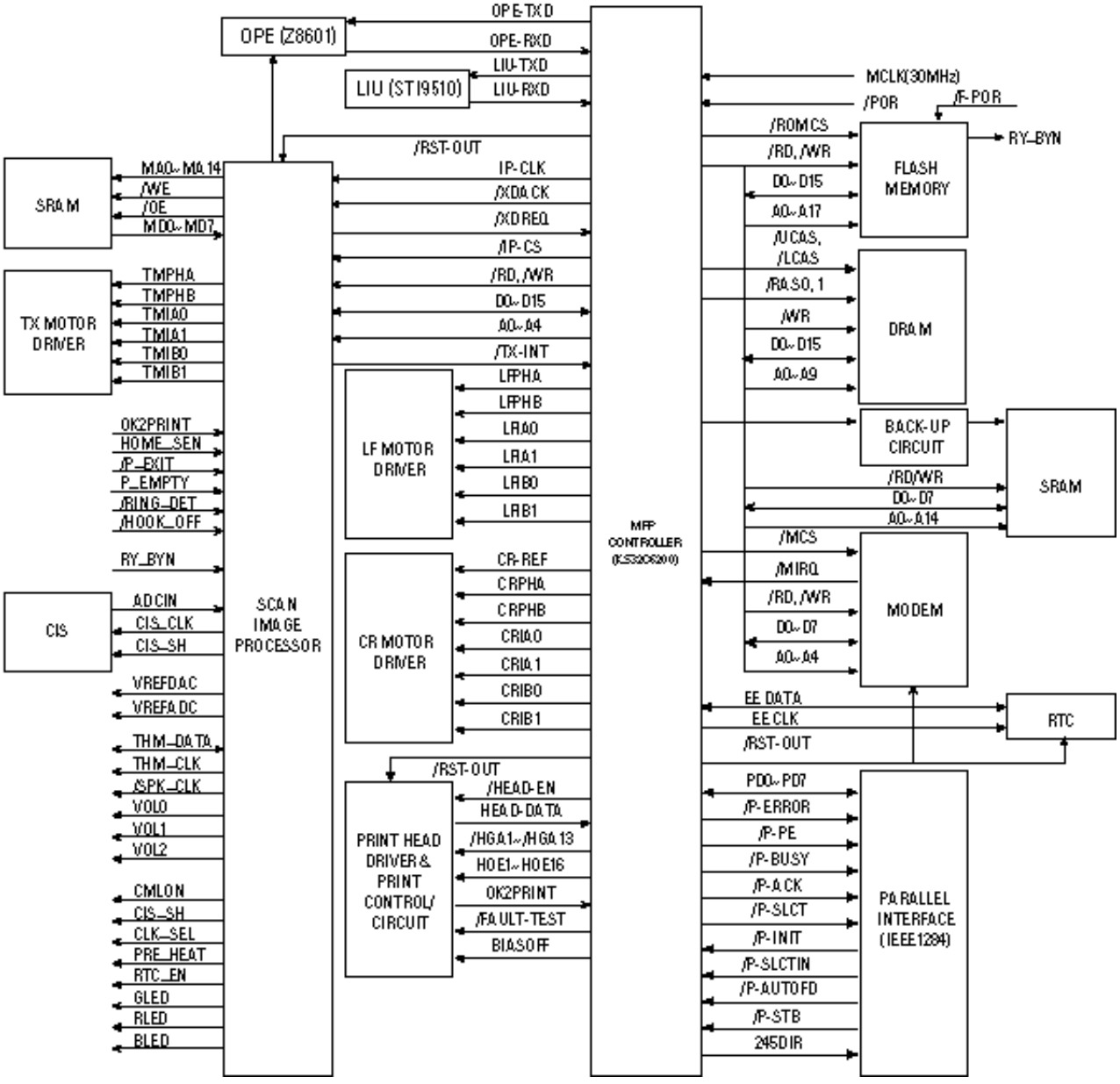


Fig.6-1-1. Entire Structure of Main Circuit for Each Key Signal

6-1-2 MFP Controller (KS32C6200 : U16)

MFP Controller consists of CPU(ARM7TDMI RISC processor), 2K-byte cache, data and address buses, serial communication part with LIU(Line Interface Unit), OPE(OPERATION PANEL) print head controller, parallel port interface, external DMApart to receive data from external color image processor (SCANIP:U18), LF/CR motor diver controller and I/O controller.

6-1-2-1. SYSTEM CLOCK

The internal clock frequency is 30MHz. 30MHz system clock (MCLK) supplied from the outside is used without being divided inside.

6-1-2-2. DATA & ADDRESS BUS CONTROL

- /RD & /WR
  /RD & /WR signals are synchronized with MCLK(30MHz) and become LOW ACTIVE. These signals are strobe signals used to read and write data when each CHIP SELECT is connected with /RD and /WR pin of RAM, ROM, MODEM and the outside devices and becomes active.

- CHIP SELECT (/IP_CS, /ROMCS, /MCS /RAMCS)
  - /IP-CS : SCANIP(U18) CHIP SELECT (LOW ACTIVE)
  - /ROMCS : ROM/FLASH MEMORY(U5) CHIP SELECT (LOW ACTIVE)
  - /MCS : MODEM(U15) CHIP SELECT (LOW ACTIVE)
  - /RAMCS : SRAM (U14) CHIP SELECT (LOW ACTIVE)

  When each CHIP SELECT is low, data can be read or written.

- D0 - D15
  - 16bit data bus

- A0 - A17
  - ADDRESS BUS (A18 - A21 are reserved.)

6-1-2-3, LIU(Line Interface Unit) Serial Communication Part

UART (Universal Asynchronous Receiver / Transmitter) at KS32C6200 enables the main and LIU, main and OPE to transmit serial data. The block diagram of UART is as follows: (Fig.6-1-2) KS32C6200 has 2 UART channels. The baud rate is 9600bps.

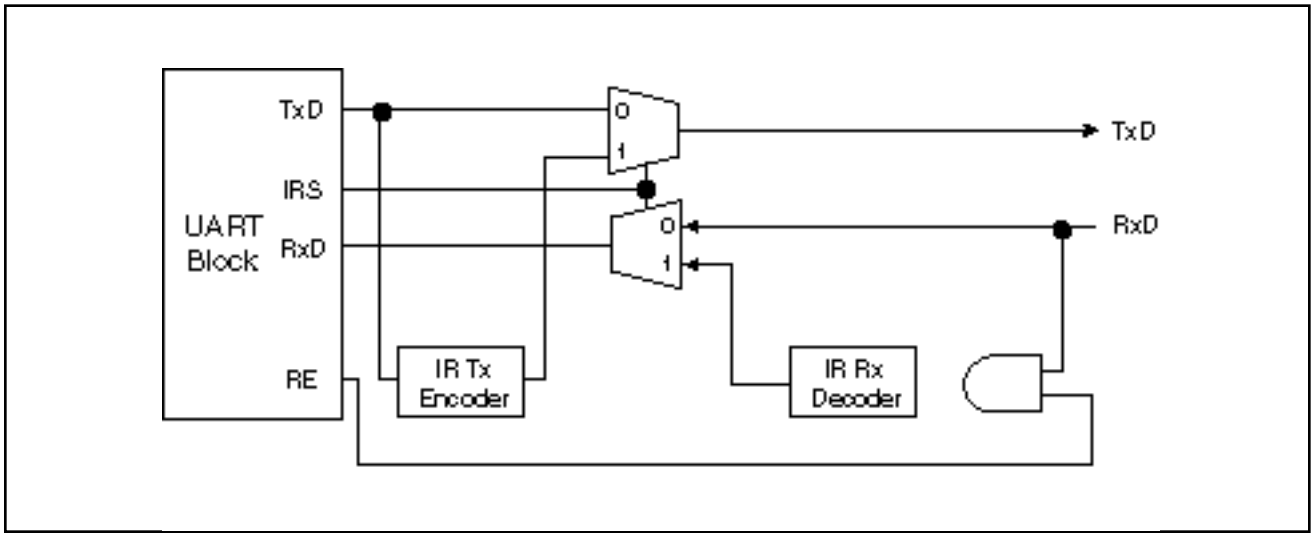


Fig.6-1-2. UART BLOCK DIAGRAM

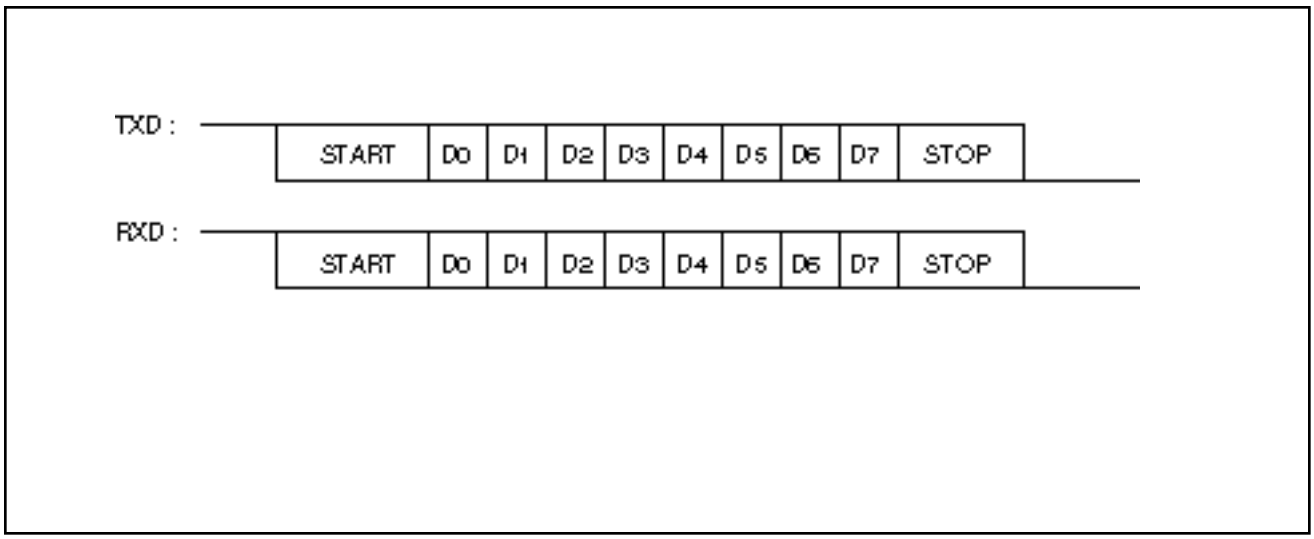


Fig.6-1-3 UART DATA FORMAT

6-1-2-4 EXTERNAL DMA

It brings data from an external device (SCANIP:U18) using DMAchannel 0. DMAREQUEST sent from an external device to KS32C6200 activates DMA ACKNOWLEDGE signal and drives DMAchannel 0 to produce CHIP SELECT and READ STROBE (/RD) at the external device and bring data from it. It generates address of destination memory, CHIP SELECT and WRITE STROBE (/WR) in order to move this data into destination memory, and then stores the data.

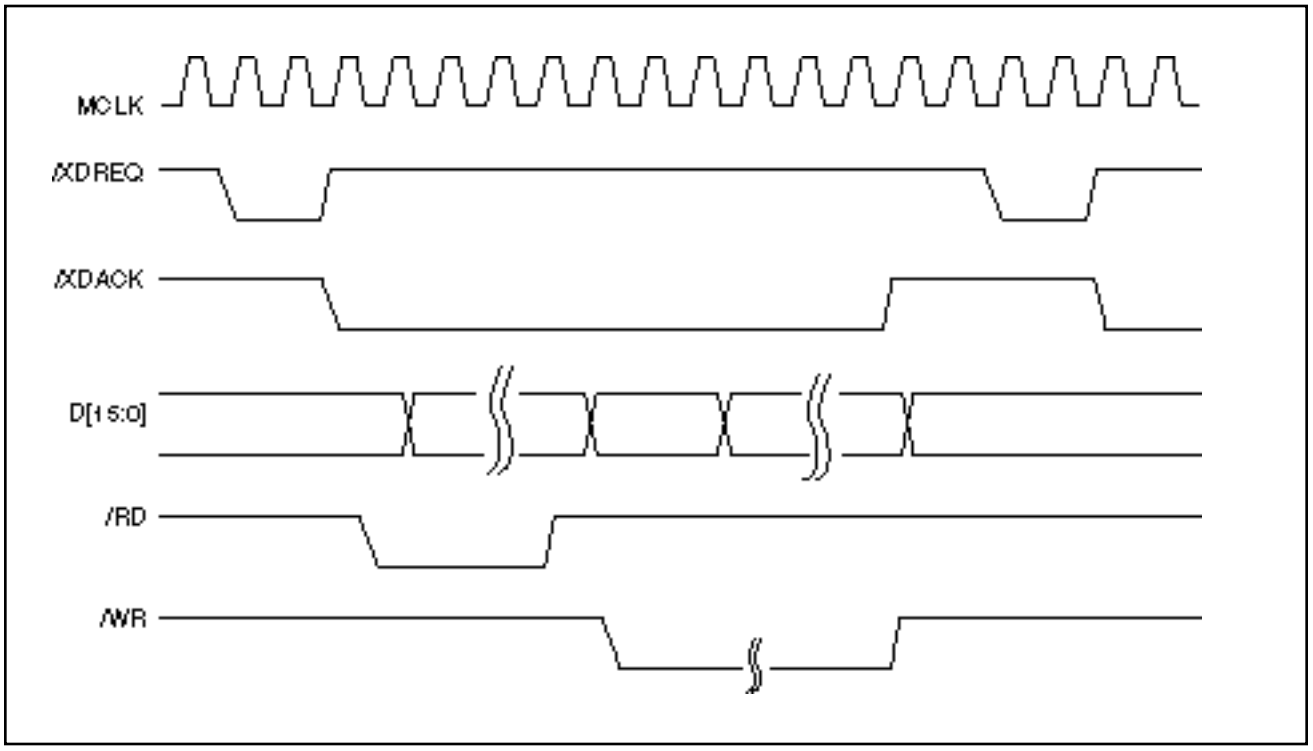


Fig.6-1-4 EXTERNAL DMA TIMING DIAGRAM

6-1-2-5. DRAM CONTROLLER

As KS32C6200 has DRAM controller in it, DRAM can be connected with external memory.
The control mode of DRAM controller enabling EARLY WRITE, NORMALREAD, PAGE MODE, and BYTE / HALF WORD ACCESS supports EDO DRAM as well as normal DRAM. DRAM READ / WRITE signals are /RD and /WR signals used to control system buses. It supports CAS BEFORE RAS for DRAM REFRESH and self-refresh mode for DRAM backup. Connected with common /LCAS, /UCAS and RAS [1:0], it consists of 2 banks. Though each may be connected with up to 1M - 4M halfword, two (2) of 512 Kbytes are connected for this product.

6-1-2-6. PARALLEL PORT INTERFACE

This part connected with the computer through the centronics connector makes possible parallel interface with the computer. Data is transmitted according to the standard of IEEE P1284. This MFP controller supports compatibility mode the traditional way to transmit print data, nibble mode (4bit data) to upload data to the computer, and duplex high-speed transmission with the computer ECP (Extended Capabilities Port: 8bit data transmission) all together.
It enables PC data to be printed and scanned data to be uploaded quickly to the computer. Besides, various data transmission and reception with the computer such as uploading received fax data, downloading fax data to be sent, and monitoring system control signals and system conditions are carried out here.

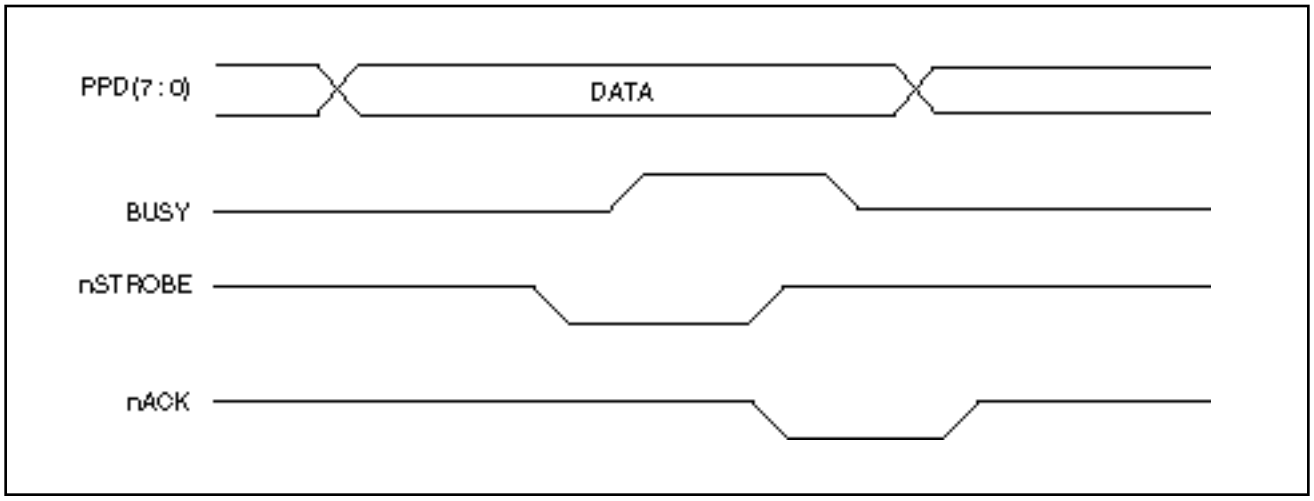


Fig.6-1-5 Compatibility Hardware handshaking Timing

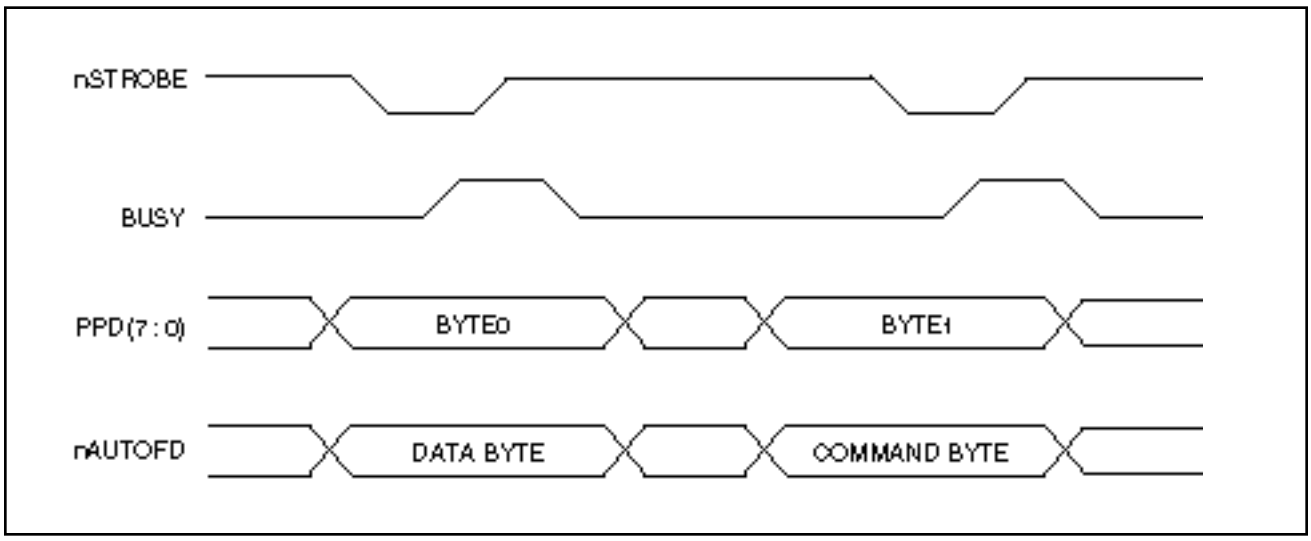


Fig.6-1-6 ECP Hardware Handshaking Timing (forward)

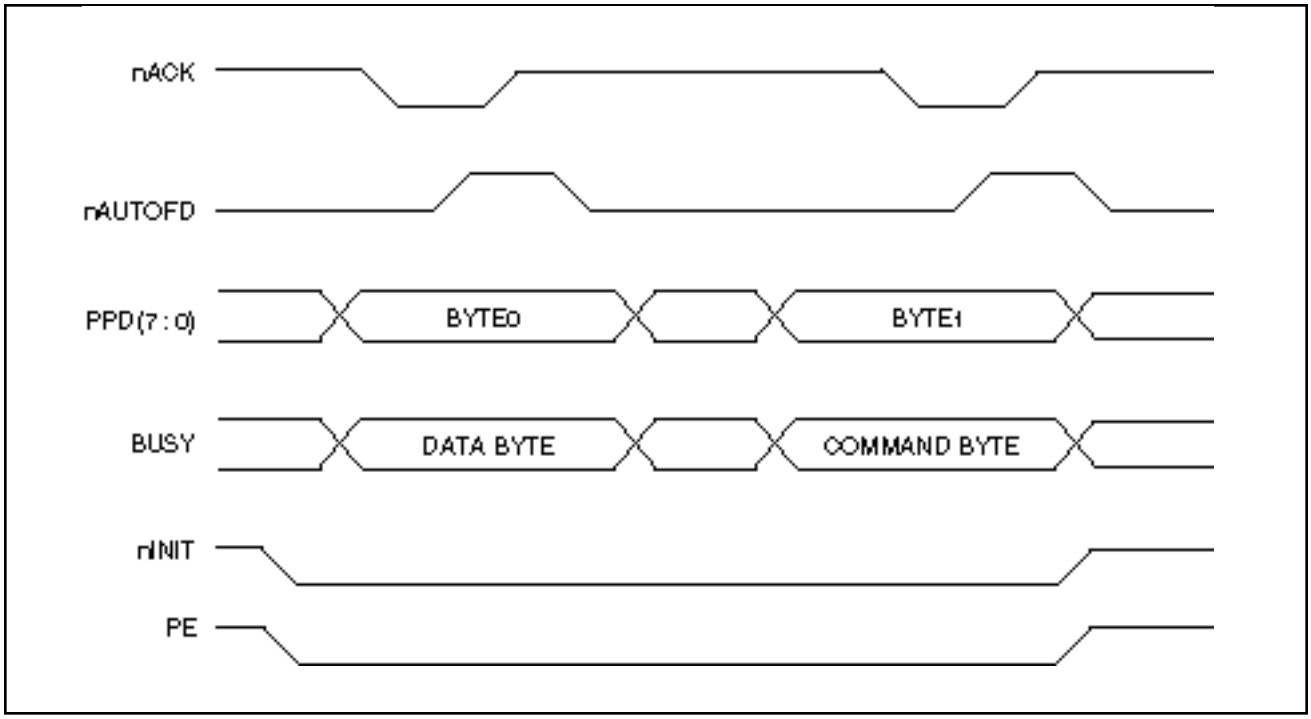


Fig.6-1-7 ECP Hardware Handshaking Timing (reverse)

6-1-2-7. INKJET HEAD CONTROLLER

This part produces major control signals used to drive INKJET head. It consists of signals to drive head nozzles, /HGA[13:1], HOE[16:1], /FAULT-TEST, /HEAD-EN, and BIASOFF, and consists of signals to check the status of the head, HEAD-DATA.

It has double height print head, system 208 nozzles for mono and 192 nozzles for color, and uses /HGA[13:1], HOE[16:1] signals and /HEAD-EN to drive these nozzles. Fig.5-1-8 is timing diagram of each signal.

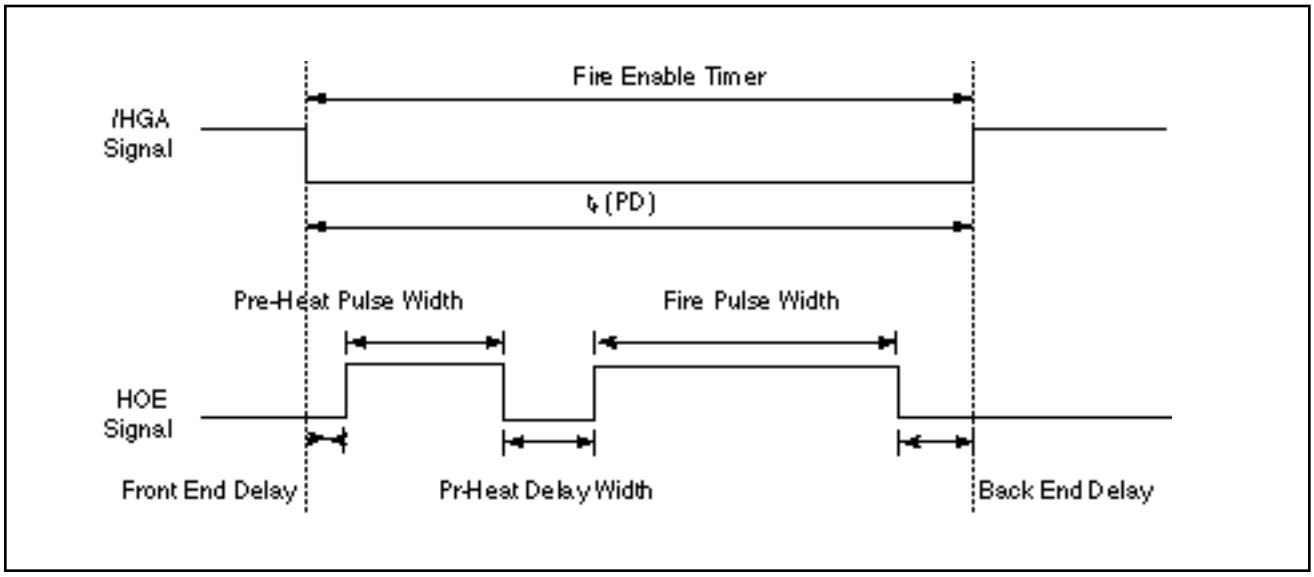


Fig.6-1-8 Timing Diagram to Drive Head

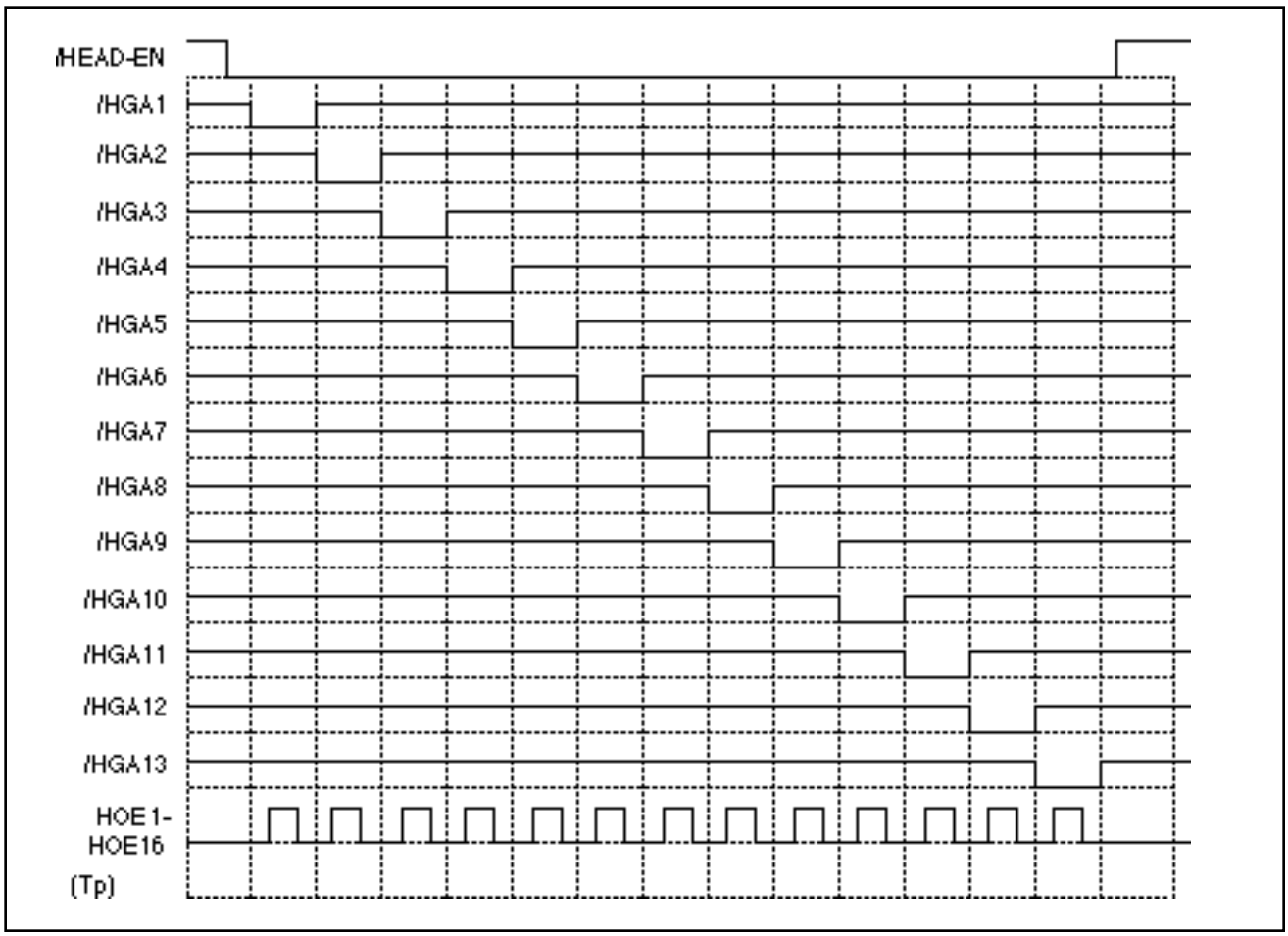


Fig.6-1-9. Timing Diagram for Each Nozzle

The above control signals are sent to head driver and the head driver converts these signals to the level (+11.75V) to drive head nozzles.

5-1-2-8. PRINTER MOTOR CONTROLLER (CRPHA, CRPHB, CRIA0, 1, CRIB0, 1, LFPHA, LFPHB, LFIA0, 1, LFIB0, 1)

MFP Controller (KS32C6200:U16) supports 2 stepper motors. It controls CR (Carriage Return) motor used to print documents and LF (Line Feed) motor used to feed and eject paper.
CR motor controller can support 75, 150, 200, 300, 600, or 1200dpi according to resolution, while LF motor controller supports uni-polar and bi-polar according to the kind of motors. Though full step, half step and software control are possible for both, bi-polar CR motor is controlled half step and LF motor is controlled half step and quarter step here.

5-1-2-9. I/O PORT FOR KS32C6200

PIN NAME	PIN NO	I/O	PORT NAME	DESCRIPTION FOR STATE	
				H	L
GOP0/TXD0	122	p	LIT_TXD	Serial Data Output to ILIU	
GOP1/TXD1	124	p	OPE_TXD	Serial Data Output to OPE	
GOP2/nEDACK	139	p	nXDACK	–	DMA Acknowledge to Scan_IP
GOP3/TONE	149	p	KEYCLICK	Keyclick Tone	
GOP4/nRST0	150	p	nRST0	Watchdog Reset Signal Output	
GOP5/nIOWR1	134	p	nFAULT_TEST	–	Head Fault Test Enable
GOP6/nIOWR2	155	p	RX_CTL	Line for RX.	Line for TX. or Remote
GOP7/nIORD1	156	p	nHEAD_EN	–	Head Enable
GOP8/nIORD2	151	p	TONE_CTL	Line Monitoring	Keyclick
GOP9/CLKOUT	152	p	IP_CLK	Clock Output for Scan_IP	
GOP10/FIREPS	153	p	nRST_OUT	External Reset Output	
GOP11/nHSC	154	p	BIASOFF	–	Head Data Read
GOP12/nHSM	30	p	CR_REF	LQ Mode Printing	Draft Mode Printing
GIP0/nRXD1	123	I	LIU_RXD	Serial Data Input from ILIU	
GIP1/nRXD2	125	I	OPE_RXD	Serial Data Input from OPE	
GIP2/nEINT1	136	I	nMIRQ	–	Modem Interrupt request
GIP3/nEINT2	137	I	nTX_INT	–	SCAN motor Interrupt request
GIP4/nEDREQ	138	I	nXDREQ	–	DMA Request from Scan_IP
GIP5/UCLK	128	I	HEAD_DATA	Serial Head Data from Head	
GIOP0/TCK	37	B	TCK	Test Clock for ICE	
GIOP1/TMS	38	B	TMS	TAP Controller Enable	–
GIOP2/TDI	39	B	TDI	Serial Data Input from Emulator	
GIOP3/nTRST	40	B	nTRST	–	TAP Controller Reset
GIOP4/TDO	41	B	TDO	Serial Data Output to Emulator	

6-1-2-10. RESET CIRCUIT

As for this product, there are 2 power resets of primary reset(/F-POR) and secondary reset(/POR) and also reset by watchdog timer (/RSTO). Primary reset is used to initialize flash memory when the system is turned on, while secondary reset is used to initialize the whole system by initializing MFP controller (KS32C6200) after primary reset. Primary reset makes flash memory wait in READ mode to fetch program codes, and secondary reset makes the main controller (KS32C6200) wake up and initialize external peripherals to operate the system. Fig.5-1-10 is Power Reset Timing Diagram.

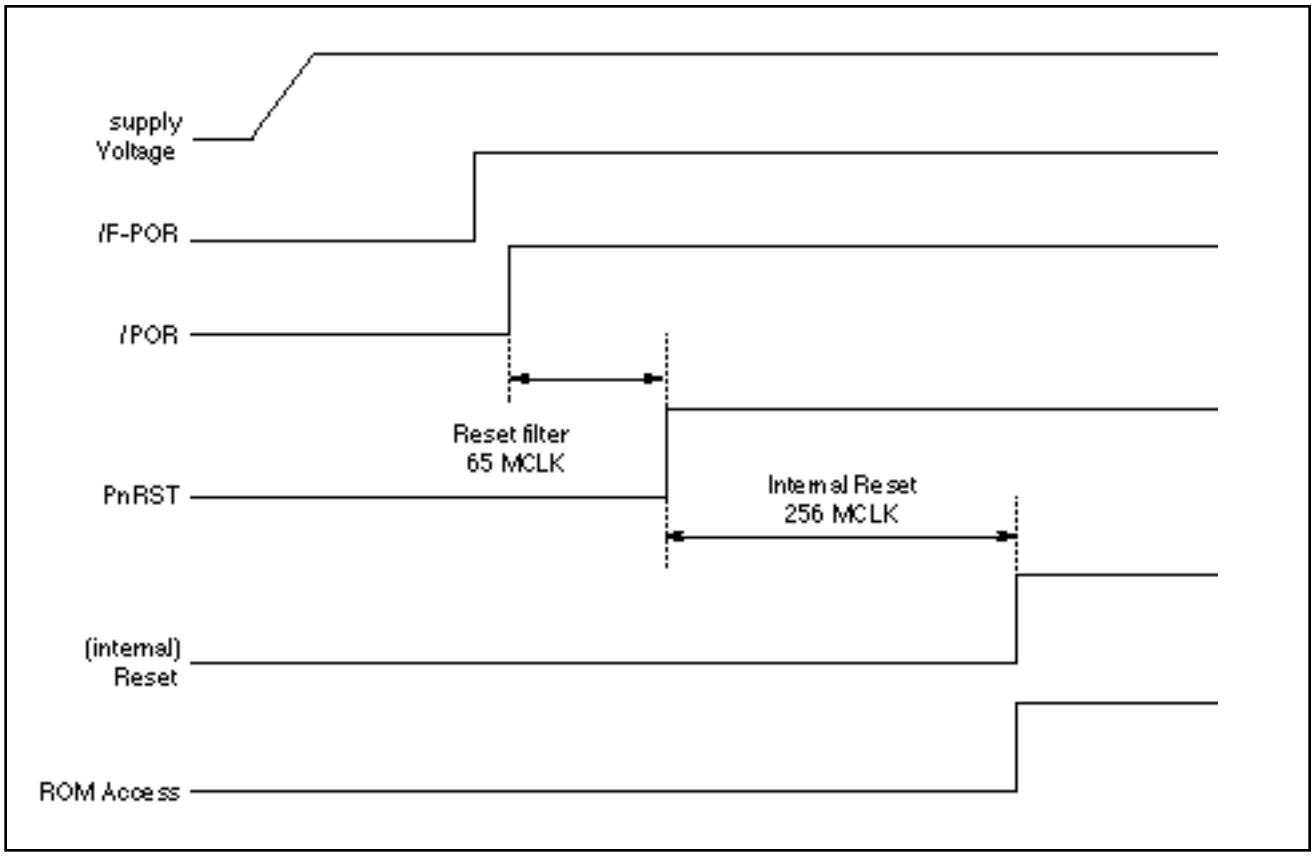


Fig.6-1-10 POWER RESET TIMING DIAGRAM

- POWER MONITOR (U103: KIA7045F)
  If +5V supplied to KIA7045F is so unstable as to reach +4.65V - +4.35V (typically 4.5V), it will recognize it as power failure. Then KIA7045F output terminal becomes low (0V) and the voltage is impressed to flash memory and KS32C6200, running RESET (LOW ACTIVE). Flash memory and KS32C6200 are reset first. Thereafter modem, print control parts and SCANIP(Color Image Processor) linked to /RSTOUT terminal of KS32C6200 are reset as well. KIA7045F output terminal of open drain structure is pulled up 5.1kΩ and put out.

6-1-3 System Memory

System memory consists of 512KB flash memory, 2MB DRAM, and 32KB SRAM. Flash memory, DRAM and SRAM are selected by each CHIP SELECT (/ROMCS, /RAS0, /RAS1, /LCAS, /UCAS, /RAMCS), and data is accessed half word (16bits) by half word and one byte (8bits) by one byte.

DRAM is designed to be able to add 2MB to the basic 2MB so that buyers can make their options.
In addition, the backup circuit built in for DRAM keeps data in user memory during at least 30-miniute power failure. Super capacitor (1F) is used as a backup element. SRAM holds telephone numbers and journal information and can keep minimum information using backup battery (Lithium).

6-1-4. Scanner

6-1-4-1. SUMMARY

This sheet-fed type device to read manuscripts has 300dpi CIS as an image sensor. The design is focused on 30-sheet ADF and 3-second quick scan functions.

6-1-4-2. SCAN RESOLUTION

– Normal(Quick) : 1/3.85mm, 1/8mm (98×203dpi)
– Fine : minor scanning 1/7/7mm, main scanning 1/8mm (196×203dpi)
– Super Fine : minor scanning 1/300inch, main scanning 1/300inch(300×3000dpi)

6-1-4-3. CIS : Contact Image Sensor improves

productivity and is designed to be replaced easily. Color models have color CIS.

① SF-4500/Msys4700/MJ-4500 : BN-30216D, 10Pin Connector
– Minimum Scan Line Time: 1.8mS
– Light Source Power : 12V
– Maximum Pixel frequency : 2MHz
– Effective Sensor Element : 2552
– Clamp Level : 1.2 - 1.6V
– Bright Output : MIN 0.8V

② SF-4500C/Msys4800/MJ-4500C : CXB-30216G, 12 Pin Connector
– Minimum Scan Line Time for one color : 1.5mS
– Color Separation : RGB LED transfer mode
– Light Source Power : 12V
– Maximum Pixel frequency : 2MHz
– Effective Sensor Element : 2552
– Clamp Level : 1.2 - 1.6V
– Bright Output : MIN 0.8V

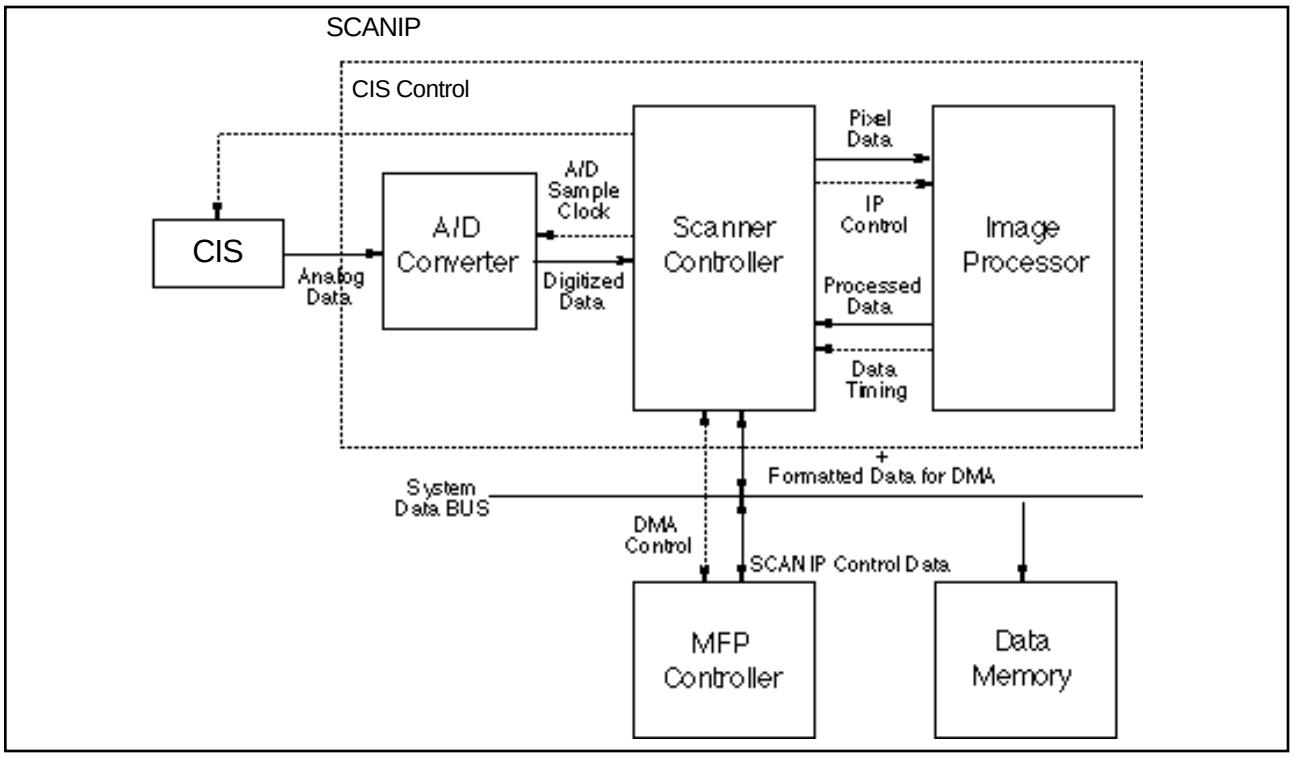


Fig.6-1-11 CIP1A Block Diagram

6-1-4-4. IMAGE PROCESSING

1) Image signal input: CIS output signals are offset at 1-4V with about 2.8V white level. Optimum input level of SCANIP is 1.5V offset and 3.5V white level. So OP AMP is used to design interface circuit of SCANIP.

2) Image processing : The scanner reads pixel data value of image sensor CIS(Contact Image Sensor) 300dpi lines by 300dpi lines, and stores it in scan buffer through TIP algorithm if Normal is selected for Image Processor SCANIP, through Error Diffusion algorithm if medium, or through DMA without algorithm if PC Scan mode. Commonly for all the three modes, it is processed after shading correction and gamma correction. 5×5 Window Processing begins after data is stored in 32K Byte external SRAM.

Image Processor SCANIPhas the following specifications:

① Package: 128 Pin QFP
② Operating Frequency: 25 - 40MHz
③ Minimum Scan Line Time: 1.5mS
④ Scan Resolution: Max. 300DPI
⑤ Scan Width: B4
⑥ Major functions
- Internal 8bit ADC
- Black / White shading correction for each color R.G.B
- Gamma correction for each color R.G.B
- Mono CIS (Canon, Dyna) interface
- Color CIS (Canon, Dyna, Toshiba) interface
- Automatic Motor Control
- Image Processing Mode : TIP, Ordered dither, Error diffusion
- 256 Gray Scale
- AGC function
- PC Gray Scan function

⑦ External SRAM: 32Kbyte, 15Ns Access Time

3) CIS LED Driver: LED in CIS is on with 11.75V. TR circuit is built in to drive this LED.
- Maximum LED current: 300mA

4) PC Scan function
- Resolution(V×H) : 300×300 / 75×75dpi (Pre-scanning mode) 196×203 / 98×203dpi
- Mono Bit Depth : 8bits Gray Scan / 1bit Text Scan / 1bit Halftone Scan
- Color Bit Depth : 24bits (8bits / R.G.B.)
- PC Interface: IEEE 1284 NIBBLE, BYTE, ECP
- TWAIN Driver: 1CD-ROM title provided along with Bundle S / W.

5) Additional Spec.
- Scan Line Time : 2.5mS / line
- Contrast Control : 3 Step (Normal / Darken / Lighten)
- Enlargement & Reduction : 25 ~ 200%

6-1-4-5 I/O PORT FOR SCANIP

REGISTER NAME	PIN NAME for ASIC	I/O	PORT NAME	DESCRIPTION FOR STATE	
				H	L
GPI	GPI0	I	OK2PRINT	Head OK	Head NG
	GPI1	I	HOME_SEN	Head parking	–
	GPI2	I	reserved		
	GPI3	I	nP_EXIT	–	Paper Detected
	GPI4	I	P_EMPTY	Paper empty	–
	GPI5	I	nRING_DET	–	Ring Detected
	GPI6	I	nHOOK_OFF	–	H/S hook off
	GPI7	I	RY/nBY	Flash Ready	Flash Busy
GPO	GPO0	p	reserved		
	GPO1	p	nOPE_RST	OPE reset off	OPE seset on
	GPO2	p	BLED(C/–)[1]	BLED On	BLED Off
	GPO3	p	RLED(C/–)[1]	RLED On	RLED Off
	GPO4	p	GLED(C/M)[2]	GLED On	GLED Off
	GPO5	p	RTC_EN	RTC Enable	RTC disable
	GPO6	p	PRE_HEAT	Head Preheat On	–
	GPO7	p	CLK_SEL	Jupiter idle mode	Jupiter ?? mode
GPIO1	GPIO0	p	reserved		
	GPIO1	p	reserved		
	GPIO2	p	reserved		
	GPIO3	p	reserved		
	GPIO4	p	reserved		
	GPIO5	p	reserved		
	GPIO6	p	reserved		
	GPIO7	p	reserved		
GPIO2	GPIO8	p	CMLON	Fax or Tel Line	Ext Phone Connection
	GPIO9	p	VOL2	Connection	
	GPIO10	p	VOL1	Bell (3 level)	Volume (4 level)
	GPIO11	p	VOL0	Bell or Volume control	
	GPIO12	p	reserved	–	
	GPIO13	p	nSPK_CTL	Audio amp. off	Audio amp. on
	GPIO14	p	THM_CLK	Clock IN for Thermometer	
	GPIO15	B	THM_DATA	Serial Data from/to Thermometer	

1 C/– : Color Only
2 C/M : Color/Mono

6-1-5 Printer

6-1-5-1. GENERAL

It drives inkjet head to print printing data received from the computer or fax data coming through the line. It roughly consists of head driver, head controller, and the ambient temperature sensor. Fig.6-1-11. Block Diagram of Printer shows the entire structure.

6-1-5-2. HEAD DRIVER (U26, U27, U32, U22)

This part drives and inks inkjet head. Color inkjet head drives 192 nozzles, while mono inkjet head drives 208 nozzles. Mono inkjet head is composed of 16 groups of 13 nozzles. As to the driver that composes each nozzle, 13 row 7-bit driver (U26, U27) selects head address and 16 column 8-bit driver (U32, U33) sends head data. Head driver converts control signals from MFP controller to +11.75V, the level to be able to drive the head, and provides them for the inkjet head.

- Row Driver Circuit (HD7:U26:U27)
  This is a 13-line signal impressed to row drive IC through the output port of MFP controller(/ HGA1 - / HGA13), used as an address to drive the head in ink cartridge. Pulse period differs according to head driving frequency. In 1200dpi (in case of Head: 12KHz) mode, timing period is 2.6usec (1 / 1200÷16 groups). The signal put in each driver(window time) is active “L”, with the biggest driver current max 100mA and output voltage +11.75V.
- Column Driver Circuit (HD8:U32,U33)
  It is the fire enable pulse of real head. 16 lines are put out as head driving data lines through the output port of MFP controller (HOE1 - HOE16). Enable pulse impressed to the head is put out within window time (Low). It has the function to move it forward or backward by the register in MFP controller. Besides the output signal may differ in accordance with the type of head (mono or color). If there is data, printing image is put out at “H”. If not, it is put out at “L”. In case of Babbage head, pulse width is always 1.3use regardless of the type of the head, with the maximum driving current 400mAand output voltage +11.75V.

6-1-5-3. HEAD CONTROLLER

This part consists of +22V Power Controller to control head driver, Fault Test, Head Detection, Substrate Heating and ambient Temperature Sensor. It checks and controls head driver and ink cartridge.

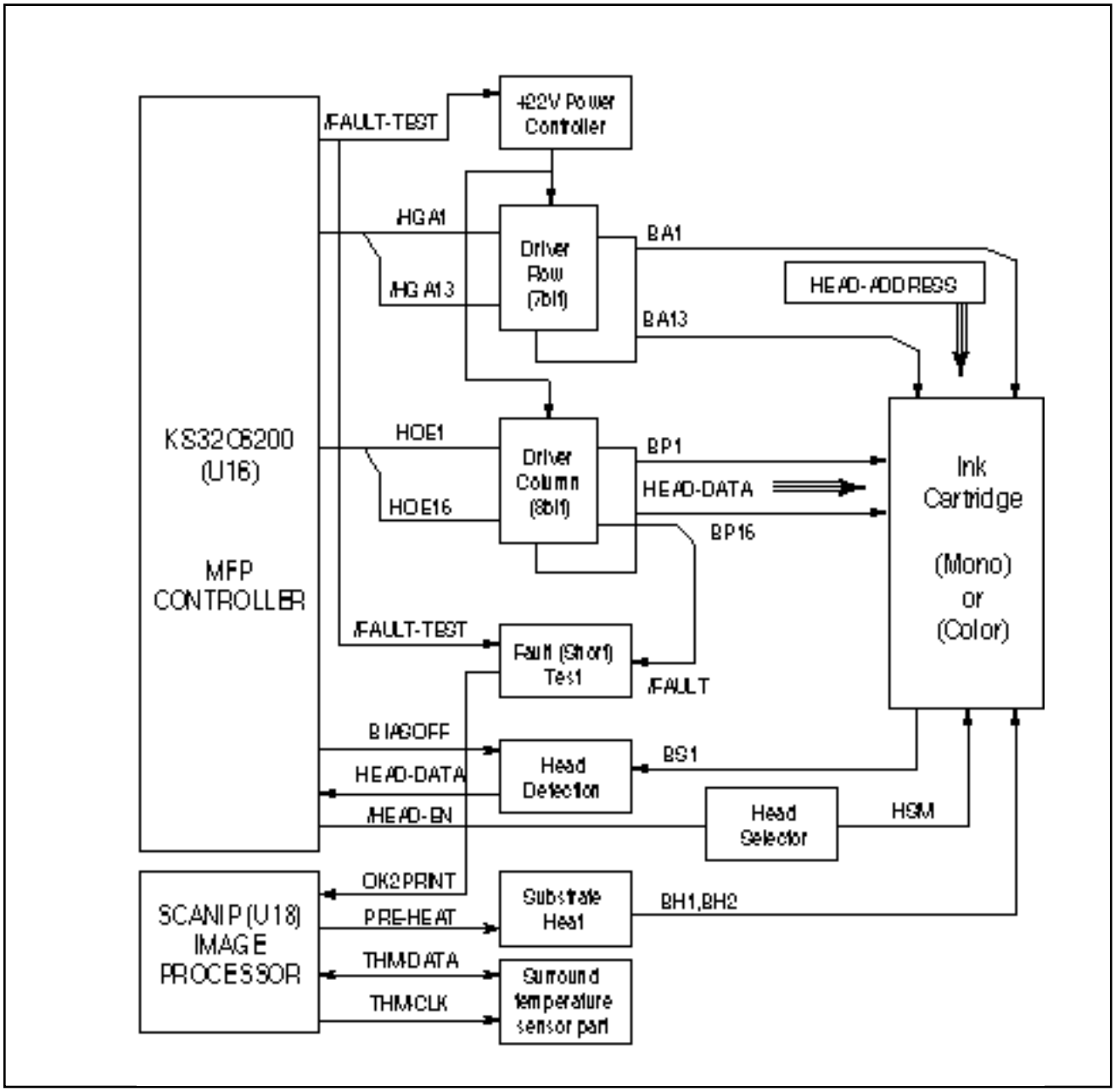


Fig.6-1-12 Block Diagram of Printer

- +22V Power Controller
  If you insert power cords, the main board will be supplied with power. /POR signal put out through reset circuit activates MFP controller (K32C6200:U16) and MFP controller puts out external circuit reset signal /RST-OUT. This /RST-OUT signal and Vrefx (+2.5V) divided through +30V are impressed to the input terminal of the comparator, putting out +22V if the output of the comparator is “high” or getting turned off if “low”.(in case of /FAULT-TEST signal: HIGH) While +22V is being impressed after /RST-OUT is “High”, comparator output gets “low” and turns off +22V driving TR(TIP112) if /FAULT-TEST signal is put out at “low” when you check a short of the head driver and the ink cartridge (head).

- FAULT TEST CIRCUIT
  This is a signal to detect whether the head receiving the output of head column driver is in a short. After /FAULT-TEST signal is put out at “low” and +22V is turned “off”, “OK2PRINT” signal is entered. The port of KS32C6200(U16) shows normal condition if “H” and a short if “L”. If you make FAULT-TEST output “L” to detect fault of the head, +22V gets off. If the head is in a short (LOW), when the level of “/FAULT-TEST” signal goes “L” and final “OK2PRINT” output goes “L”. KS32C6200(U16) reads this signal and checks whether the head input receiving the driver output is in a short. Diode cathode is attached to each output transistor collector in the column driver. 8 anode terminals of diode become common as one and put out /FAULT signal, which is pulled up by bias circuit controlled by /FAULT-TEST and shows the condition by OK2PRINT through the comparator.

- SUBSTRATE HEAT CIRCUIT
  Mono ink cartridge of Babbage head is 600dpi head that uses pigment ink. It is very sensitive to the temperature in and around the cartridge. In particular, the viscosity of ink affects print quality as it is inversely proportional to temperature by an exponential function. This signal used to compensate it helps you get equal inking quality by warming the ink chamber in the cartridge with aluminum pattern heater before starting to print if the surrounding temperature is lower than standard (below 35°…).(Refer to Timing Chart.) It sends PRE-HEAT signal through I/O port of SCANIP(Color Image Processor:U18) and supplies +11.75V.

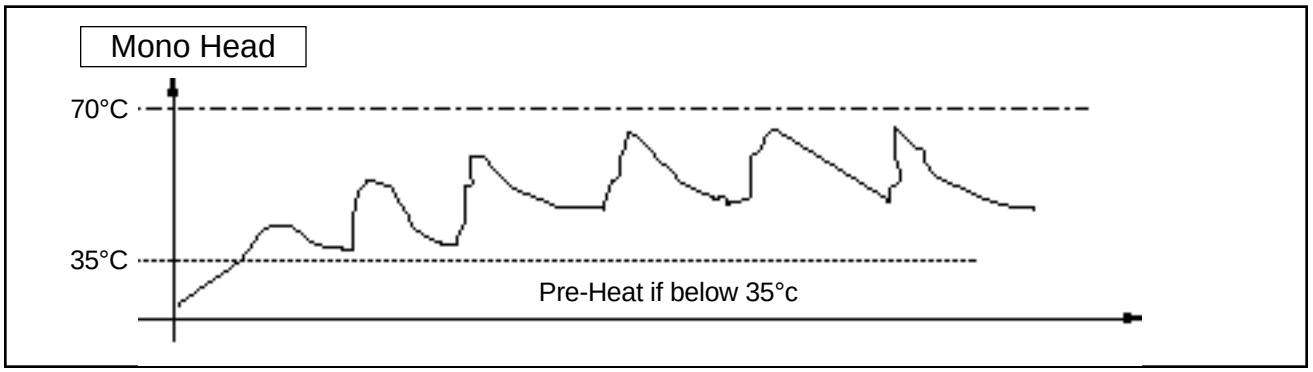


Fig.6-1-13. Temperature around Mono Head

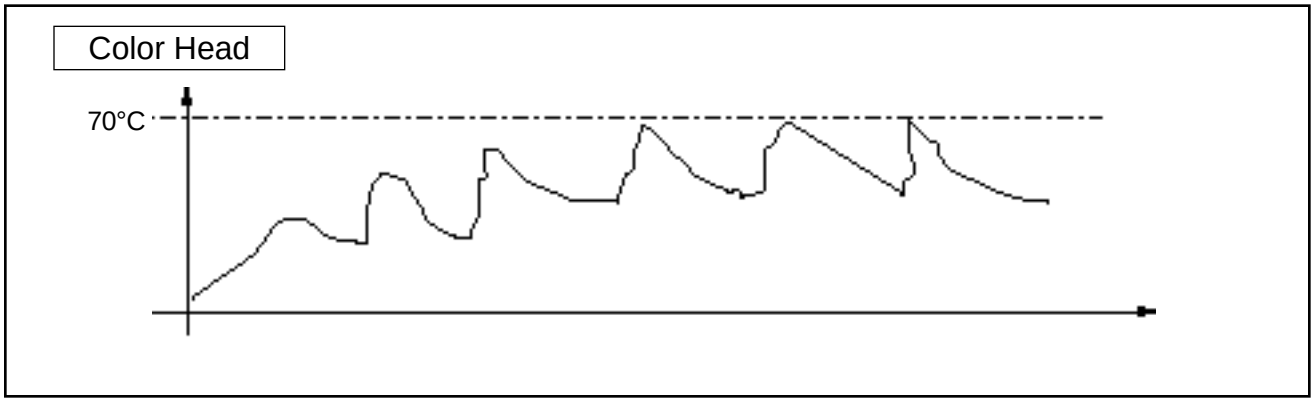


Fig.6-1-14. Temperature around Color Head

- HEAD DETECTION CIRCUIT
  Babbage ink cartridge has 8-bit mask ROM I.D. to check the type of cartridge. In order to detect the head, HSM signal is used as ENABLE signal and BA3 signal as START & STOP BIT, and BA1 and BA2 as clock signal of each bit, and ID signal in the cartridge is put in HEAD-DATAport of KS32C6200 through BSF line. With each bit controlled, 8bit I.D data is read and STOP bit is put out of BA3(LOAD) port. Then it finishes.
  If data is mono, it is 07H. If color, 08H.

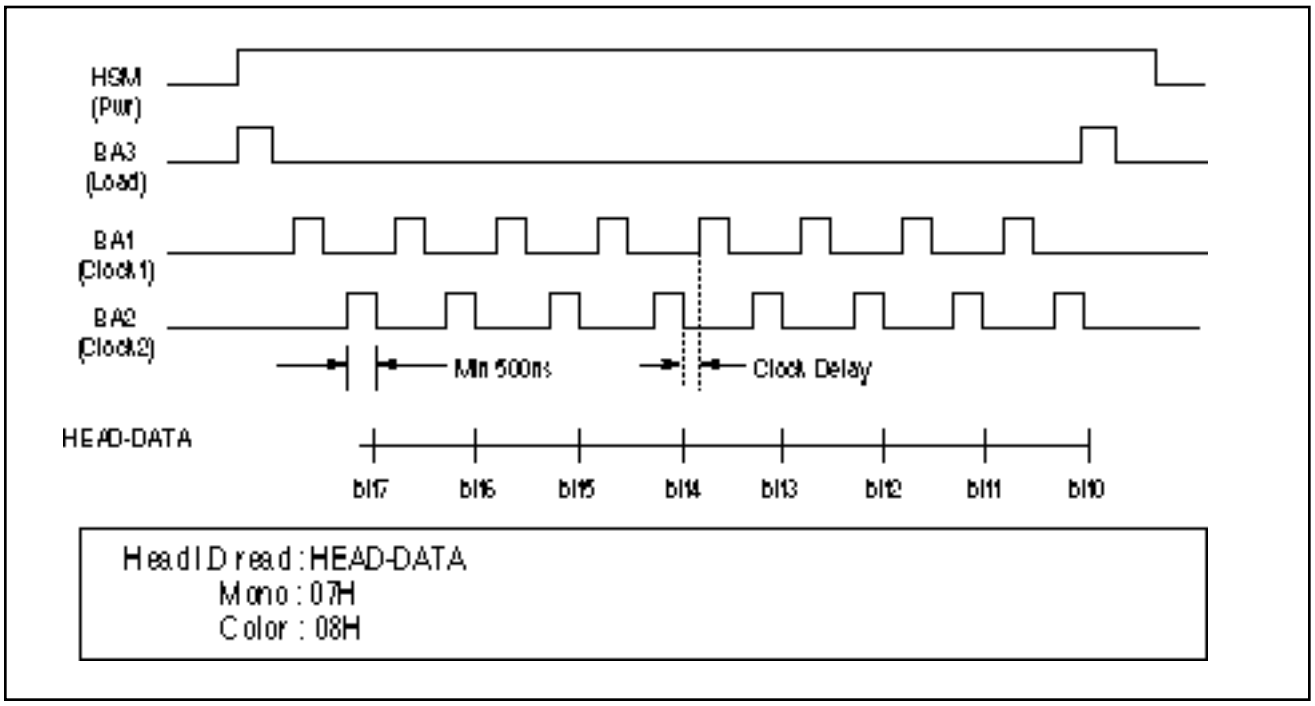


Fig.6-1-15. HEAD DETECTION TIMING DIAGRAM

• SURROUNDING TEMPERATURE SENSOR DS1621S(DALLAS SEMI.) is applied to read the temperature around ink cartridge. It is used to get optimum inking quality by keeping the viscosity of ink in the cartridge in the specified lerel. The way to read temperature is similar to EEPROM, controlled by THM-CLK, THM-DATALINE. Digital thermometer to check the surrounding temperature is assembled along with home sensor in the frame of assembly CR. After each line is inked, it reads the surrounding temperature and heats substrate heater in the ink cartridge during the accelerating time of CR to keep the viscosity of ink in the specified lerel.

6-1-5-4. HEAD DRIVING TIMING

Control signal from MFP controller (KS32C6200:U16) enters the head driver (U26, U27, U32, U33) and it becomes the level to be able to drive the head nozzles (+11.75V). It is depicted in the following diagram.

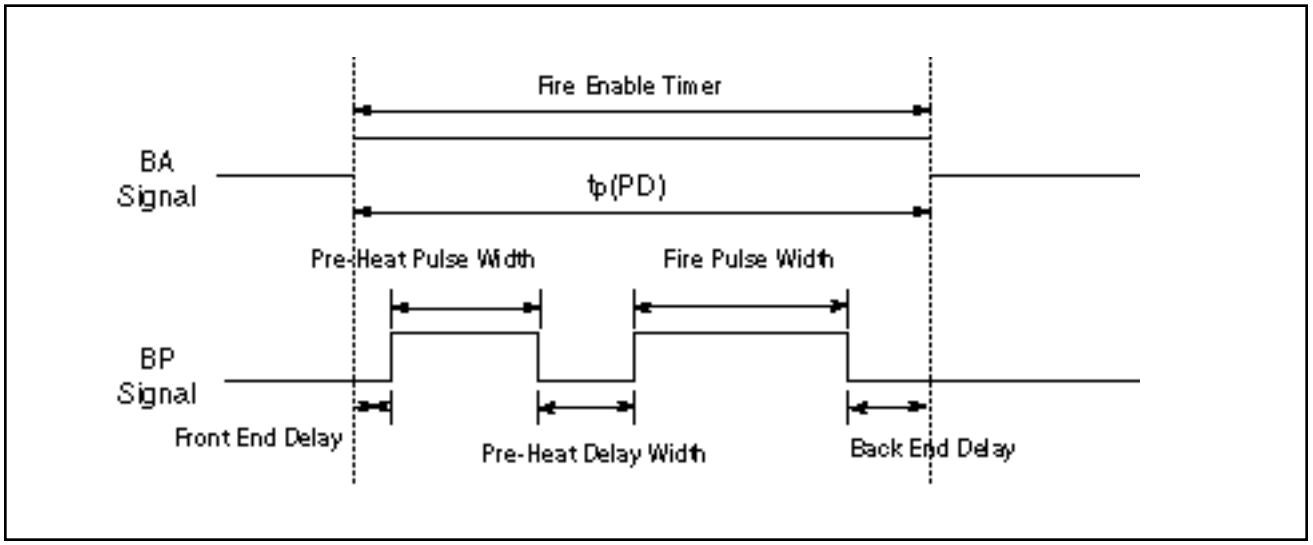


Fig.6-1-16. HEAD DRIVING TIMING DIAGRAM

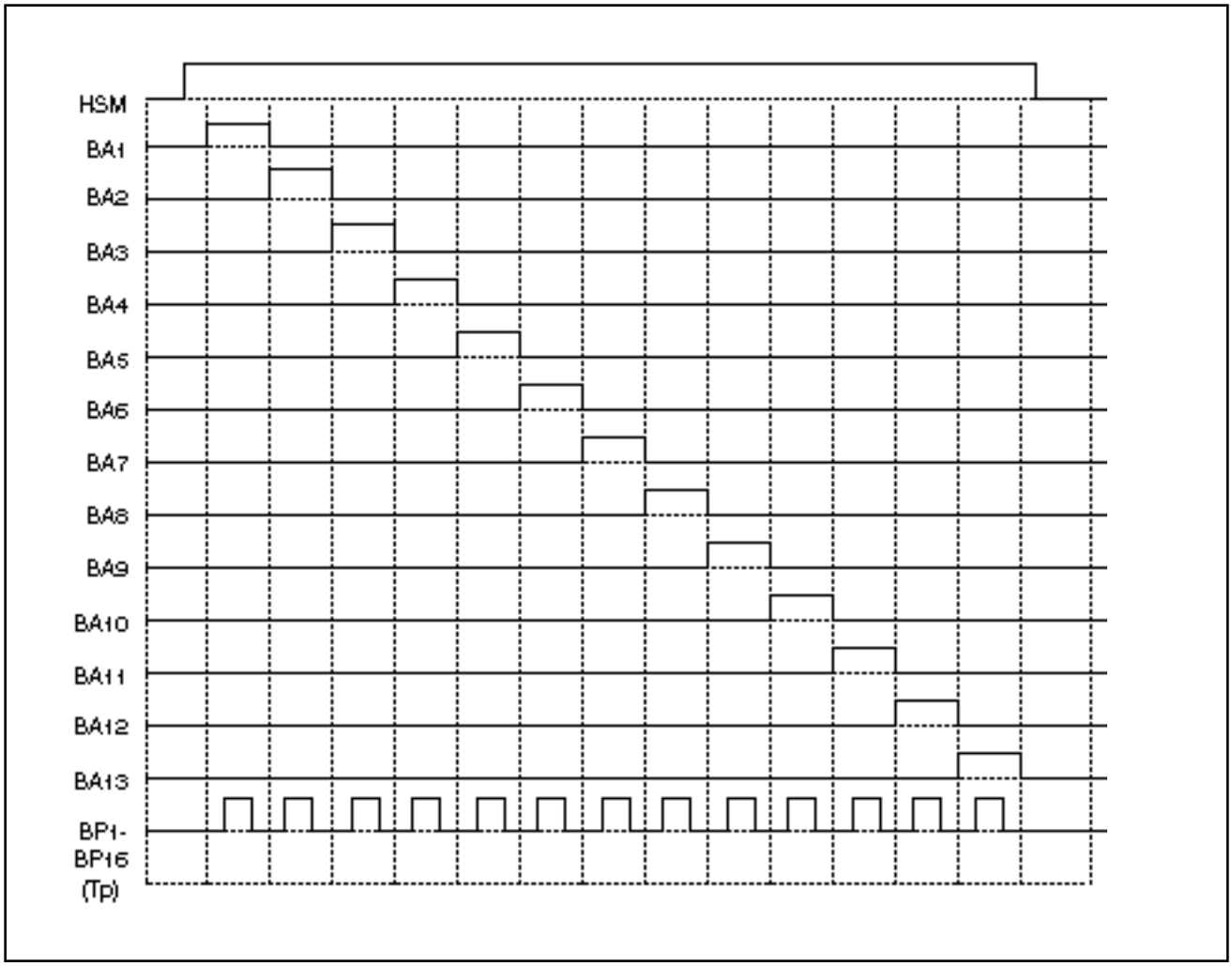


Fig.6-1-17. TIMING DIAGRAM FOR EACH NOZZLE

6-1-5-5. INK CARTRIDGE

• PIN ARRAY OF MONO INK CARTRIDGE
There are 208 heater chips in mono ink cartridge.

Column Data(BPx)	Address (BA1_ ~ BA13_)												
	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1	21	15	9	3	23	17	11	5	25	19	13	7
2	20	14	8	2	22	16	10	4	24	18	12	6	26
3	27	47	41	35	29	49	43	37	31	52	45	39	33
4	46	40	34	28	49	42	36	30	50	44	38	32	52
5	53	73	67	61	55	75	69	63	57	77	71	65	59
6	72	66	60	54	74	68	62	56	76	70	64	58	78
7	79	99	93	87	81	101	95	89	83	103	97	91	85
8	98	92	86	80	100	94	88	82	102	96	90	84	104
9	105	125	119	113	107	127	121	115	109	129	123	117	111
10	124	118	112	106	126	120	114	108	128	122	116	110	130
11	131	151	145	139	133	153	147	141	135	155	149	143	137
12	150	144	138	132	152	146	140	134	154	148	142	136	156
13	157	177	171	165	159	179	173	167	161	181	175	169	163
14	176	170	164	158	178	172	166	160	180	174	168	162	182
15	183	203	197	191	185	205	199	193	187	207	201	195	189
16	202	196	190	184	204	198	192	186	206	200	194	188	208

• PIN ARRAY OF COLOR INK CARTRIDGE

There are 192 heater chips in mono ink cartridge. One cartridge has 64 Cyan, 64 Magenta, 64 Yellow heaters and (64 x 3 colors) 192 nozzles.

Column Data(BPx)	Address (BA1_ ~ BA13_)												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
1	-	19	13	7	11	21	15	9	3	23	17	11	5
2	15	12	6	-	20	14	8	2	22	16	10	4	24
3	25	45	39	33	27	47	41	35	29	49	43	37	31
4	44	38	32	26	46	40	34	28	48	42	36	30	50
5	51	71	65	59	53	73	67	61	55	75	69	63	57
6	70	64	58	52	72	66	60	54	74	68	62	56	76
7	77	97	91	85	79	99	93	87	81	101	95	89	83
8	96	90	84	78	98	92	86	80	100	94	88	82	102
9	103	123	117	111	105	125	119	113	107	127	121	115	109
10	122	166	110	104	124	118	112	106	126	120	114	108	128
11	129	149	143	137	131	151	145	139	133	153	147	141	135
12	148	142	136	130	150	144	138	132	152	146	140	134	154
13	155	175	169	163	157	177	171	165	159	179	173	167	161
14	174	168	162	156	176	170	164	158	178	172	166	160	180
15	181	-	-	189	183	-	-	191	185	-	-	-	187
16	-	-	188	182	-	-	190	184	-	-	192	186	-

6-1-6 Motor Driver

6-1-6-1. GENERAL

This product use 3 stepper motors, i.e. CR(Cartridge Return) motor and LF(Line Feed) motor, TX (Transmission) motor.
CR motor moves left and right all-in-one carriage of inkjet head and shuttle scanner. It helps the printer print accurately on the paper. LF motor is driven to feed and eject paper for printing and to feed and eject documents to read for scanning. Bi-polar CR motor is controlled half step with maximum 24ips(inch / sec), while LF motor half step and
quarter step at maximum 6ips.

6-1-6-2. CR (CARRIAGE RETURN) MOTOR DRIVING CIRCUIT

CR motor moves the carriage left and right when ink cartridge prints something on paper.

- Motor Type : Stepper motor, bi-polar
- Driving Voltage : +30V
- Winding Resistance : 6Ω ± 10%
- Driving IC : TEA3718DP × 2

CR_REF	CRIA1 (CRIB1)	CRIA0 (CRIB0)	CURRENT(mA)	OPERATION	REMARK
H	L	L	490	Mono LQ is being driven	
L	L	L	670	Color draft is being driven	
L	L	L	670	Mono draft is being driven	
X	H	H	0	No current	

As shown in the above table, current in each mode is adjusted by voltage of driver(U25, U28) CRVREF input. If the output of CR_REF signal controlled by MFP controller(U16) is “low”, TR(Q12) will be turned off and the voltage put in to CRVREF of
driver (U25, U28) with +5V divided will go up (+4.5V).

It becomes the standard of the driver, resulting in high current. If CR_REF output is “high”, TR(Q12) will be turned on and the voltage put in to CRVREF will go down (+3.0V), resulting in low current in the motor.

6-1-6-3. LF (LINE FEED) MOTOR DRIVING CIRCUIT

LF motor is driven to feed and eject documents and paper.
- Motor Type: stepper motor, bi-polar
- Driving Voltage : +30V
- Winding Resistance : 12Ω ± 10%
- Driving IC : PBL3717A × 2

LFIA1	LFIA0	CURRENT(mA)	OPERATION	REMARK
L	L	670	When feeding document/paper	
L	H	400	When ejecting document/paper	
X	H	0	No current	

6-1-6-4. TX(TRANSMISSION) MOTOR DRIVING CIRCUIT

TX Motor is driven at maximum 1200pps when feeding or ejecting sheets.
- Motor Type: stepper motor
- Driving Voltage : +30V
- Winding Resistance : 4.6Ω ± 10%
- Step Degree : 7.5 deg / step
- Driving IC : PBL3717A × 2

TXIA1	TXIA0	CURRENT(mA)	OPERATION	REMARK
L	L	670	Quick Scan/Fine/Super Fine	
H	L	221	Standby	
H	H	0	Idle	

Driving speed for each mode

MODE	PHASE	SPEED	REMARK
Quick Scan	2–2 phase	1200pps	
Fine	1–2 phase	400pps	
Super Fine	2–2 phase	400pps	

6-1-7 FAX Transceiver

6-1-7-1. GENERAL

This circuit processes transmission signals of modem and between LIU and modem.
This circuit is added only to SmartJet 2000, SF-4300C.

6-1-7-2. MODEM (U15)

KS16117 is a single chip fax modem. It has functions of DTMF detection and DTMF signal production as well as functions of modem. TX OUT is transmission output port and RX IN is received data input port. /POR signal controlled by MFP controller (U16:KS32C6200) can initialize modem(/RST_OUT) without turning off the system. D0 - D7 are 8-bit data buses. RS0 - RS4 signals to select the register in modem decide the mode. /CS is a
signal to select modem chips. /RD and /WR signals control READ and WRITE respectively. /IRQ is a signal for modem interrupt.
Transmission speed of KS16117 is supported up to 14.4k.

6-1-7-3. TRANSMITTER

This circuit processes transmission output, analog signal of modem(KS16117).
Output signal in each mode goes out of modem (TXOUT:U15-44). After D/A signals are smoothed and filtered through active filter (U12-2), they are buffered under OPAMP(U12-6) and put out to LINE through LIU board.

6-1-7-4. RECEIVER

In the receiving mode, analog signals coming in through LIU board are amplified at OP AMP (U13-6), and then transmitted to input terminal of modem (RXIN:U15-45) through smoothing filter (U13-2).

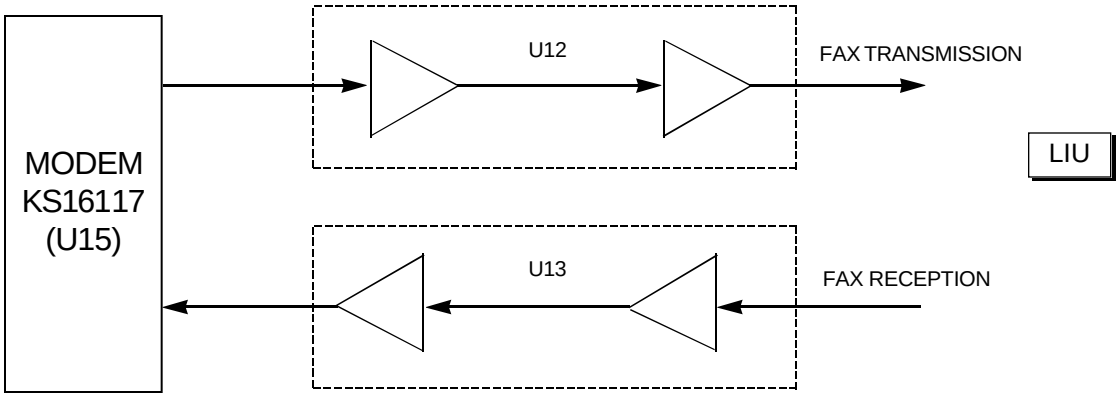


Fig.6-1-18. FAX TRANSCEIVER

6-2-1. SUMMARY

OPE Board is separated functionally from the main board and operated by the micom(Z8601) in the board. OPE and the main use UART (universal asynchronous receiver / transmitter) channel to exchange information. OPE reset can be controlled by the main. OPE micom controls key-scanning and LCD and LED display, detects documents and senses SCAN position. If there occurs an event in OPE (such as key touch and sensor level change), it sends specific codes to the main to respond to the situation and the main analyzes these codes and operates the system. For example, if the main is to display messages in OPE, the main transmits data through UART line to OPE according to the designated format and OPE displays this on LCD, LED. OPE's sensing is also transmitted to the main through UART line and then the main drives necessary operation.

6-2-2 OPE Circuit

OPE PBAconsists of U1 (MICOM, Z8601), LCD, key matrix, LED indicators, SCAN position sensor and the document detect sensor. Refer to OPE Schematic Diagram and Wiring Diagram sections of this manual.

- Signals from the key matrix are delivered to U1X / Y input pin group (P1-x).
- U1 pin 4 (TX DATA) is the UART code sent to MAIN PBA.

- Display from the controller is received at U1 pin 5 (RX DATA).
- LCD drive signals are sent from U1 P2-x pin group, P3-4~P3-6 pins.
- Machine status LED drive signals are sent from U1 P0-x pin group.
- Document detect sensor output is received at U1 pin 33 (P3-3).
- Scan position sensor output is received at U1 pin 43 (P3-1).

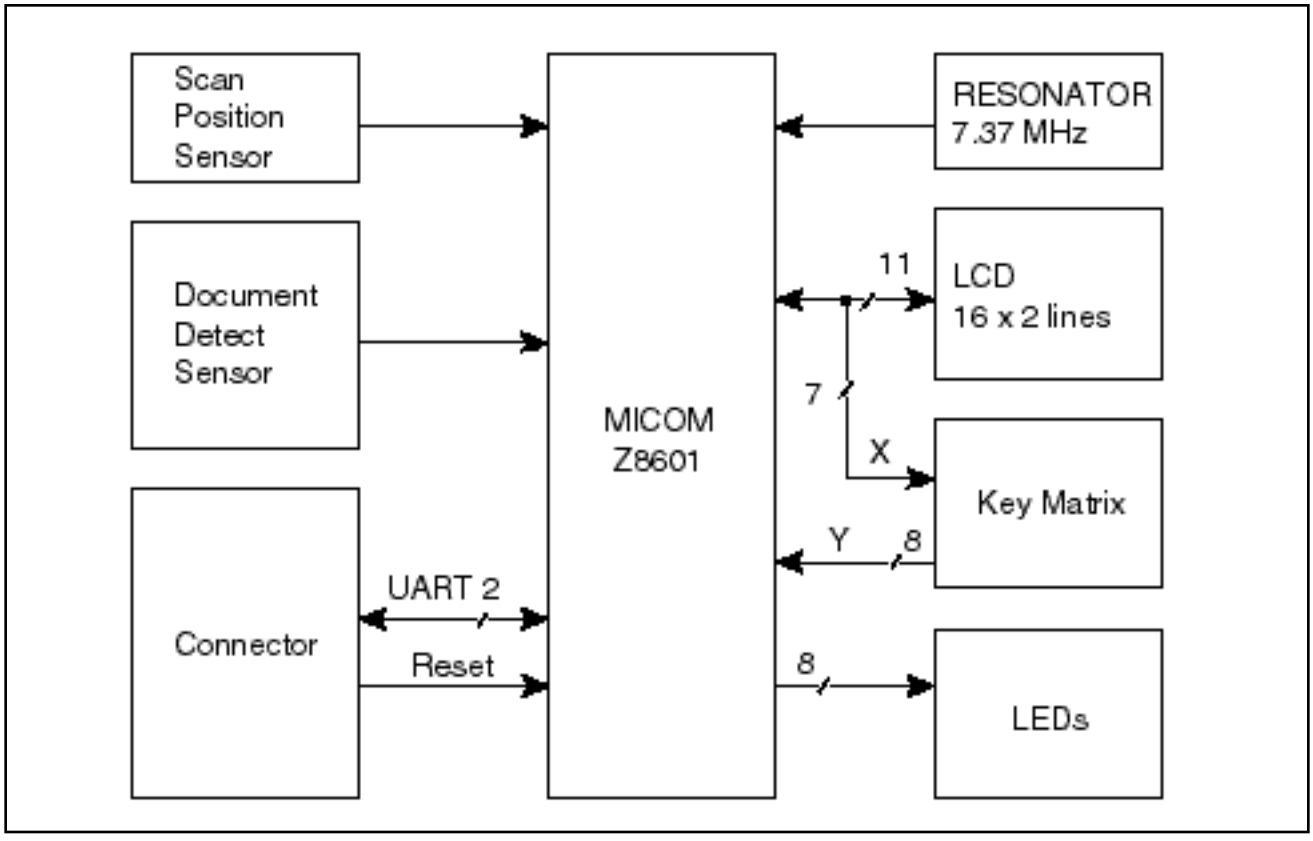


Fig.6-2-1. OPE BLOCK DIAGRAM

6-3-1 Summary

LIU(Line Interface Unit) circuit added only to SF-4500, SF-4500C is controlled by the main circuit. It monitors telephone line and helps interface between the system and the telephone line. It uses 1-LIU(STI9510) to control the whole LIU, MODEM / LINE INTERFACE, RING SIGNAL DETECTOR, DIALER, LINE CURRENT DETECTOR, and SERIAL INTERFACE.

6-3-2 Modem/Line Interface

This is the path through which transmitted and received data of modem is put in and out.

- CML1 Relay: It divides telephone line into external telephone and fax.
- U3-3 TIT(Transformer Input from Transformer): This single ended input receives image signals from modem through transformer T2 and transmits them on telephone line.
- U3-40 ROT(Receive Output Transformer): This output transformer receives signals on telephone line and delivers them to modem through transformer T1. It has AC impedance of 10Kohm or over.
- AC impedance: Normal operation range of U3(STI9510) is from 15mAto 100mA. DC characteristics depend on the voltage of U3-37 LI(Line Input) terminal and the voltage of resistance R48 between U3-37 LI(Line Input) terminal and U3-39 LS terminal.

6-3-3 Ring Signal Detector

- U3-28(MO) terminals are ring signal output terminals. Q4 and Q5 put out ring signals and drive Piezzo. It has only the functions related to ring detection such as driving the photocoupler of U4 and delivering ring signals to MFP controller of the main.

6-3-4 Dialer

6-3-4-1. MF DIAL

- Default mode it is set in DP. You can change it to MF mode by control of MFP controller.
- MF signal can be measured at (tone level of low group: typical - 14dBm) U3-4 MFO(DTMF Generator Output). The signal is adjustable by R40, R41 and C29. The adjusted signal enters U3-9 MFI (DTMF Amplifier Input) and is amplified to be transmitted on telephone line.
- U3-39 LS(Line Current Sense Input) terminals show the final signals transmitted to telephone line.

6-3-4-2. DP DIAL

- If U3-2(DMS) is made Vcc by R42, it is set at 33:67 DP signal. If it is made Vss by R43, it is set at DP signal. This product is set at DP signal.
- DP signal is made by U3-27(DPn) terminals. This signal turns on / off Q1. The signal made at that time turns on / off Q2, which interrupts DC current on telephone line and puts out pulse signal on telephone line.
- U3-35 CS terminals : It makes Make Resistance by shorting telephone line with Vss during Make period of DP dial.

6-3-5 Line Current Detector

- When CML1 relay connects telephone line, U3 (STI9510) of LIU board and MFP controller of the main board (U16) start communication through UART. U3 of LIU board sends signal that includes information of line current value, whenever it receives orders or data from U16 of the main board.

6-3-6 Serial Interface

- This part does serial communication with MFP controller of the main board (MAIN PBA:U16) that controls the whole system. It controls LIU by giving and taking all control orders and line status.
- U3-11 RxD : Schmitt Trigger input, Receiving terminal.
- U3-29 TxD : Open Drain output terminal
- Standard UART communication
  - Baud Rate : 9600bps
  - Start, Stop bit : 1bit each
  - Data bits : 8 bit
  - Parity bit : none

6-3-7 MAJOR FUNCTIONS OF PARTS

1) U3 : STI9510
   - Key part of LIU board. Speech Network, Dialer, Ringer and UART are built in one IC package.

2) U5 : PC817
   - Photo coupler. It enables UART of U3(STI9510) to receive control signal or dialing information from MFP controller of the main board (U15).
   - Insulation Detween prinary and secondany circuit part.

3) U6 : PC817
   - Photo coupler. It enables UART(U3-29:TxD) of U3(STI9510) to deliver telephone line status or response signal about control signal or dialing information from LIU MFP controller of the main board (U15).
   - Insulation Detween prinary and secondany circuit part.

4) U4 : PC817
   - It senses and delivers ring signal to the main board.
   - Insulation Detween prinary and secondany circuit part.

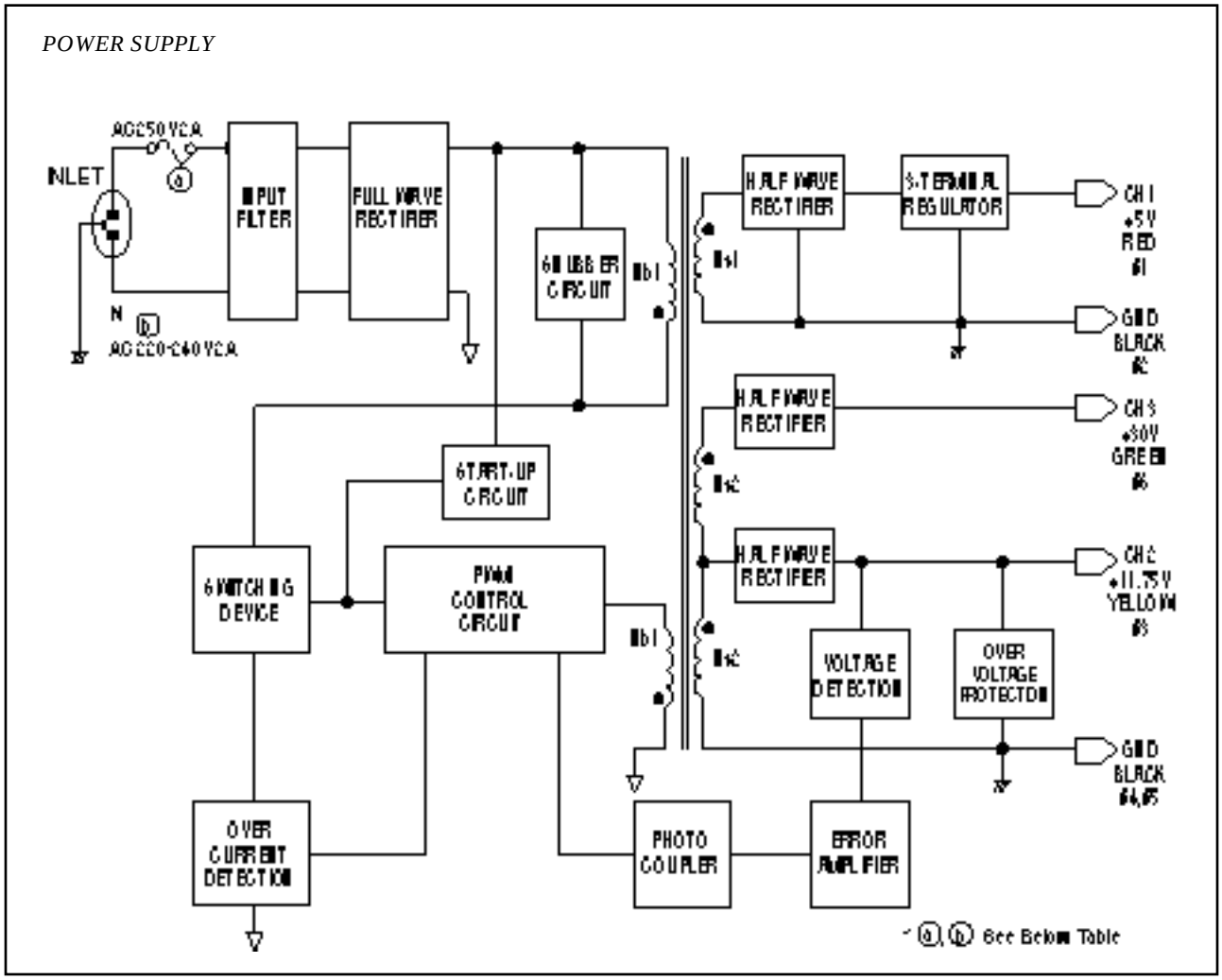
5) U2 : PC814
   - It senses hook-off (Line connection) of the external telephone and delivers it to the main board.
   - Insulation Detween prinary and secondany circuit part.

6) BD1 : BRIDGE DIODE
   - Regardless of the polarity of DC power from telephone line, the voltage put out on Pin.1 has always + polarity against pin Pin.2. So DC loop forms always in the same direction regardless of the polarity of the telephone line.

7) T2,T3 : TRANSFORMER
   - It delivers signals from the telephone line to modem or signals from modem to the telephone line.
   - Insulation Detween prinary and secondany circuit part.

6-4-1 Block Diagram of Power Circuit

Refer to the following block diagram.



6-4-2. Specifications of Power Circuit

6-4-2-1. INPUT CONDITIONS

		120V	220V	Free Voltage
1	Input Rated Voltage	AC120Vac (a)	AC220–240Vac (a)	AC110–240Vac (a)
2	Input Voltage Turning Range	AC85–135Vac (b)	AC180–270Vac (b)	AC85–270Vac (b)
3	Rated Grequency	60Hz	50–60Hz	50–60Hz
4	Frequency Range	57–63Hz	47–63Hz	47–63Hz
5	Input Current	0.5Arms	0.3Arms	0.5Arms

6-4-2-2. OUTPUT CONDITIONS

NO	ITEM	CH1	CH2	CH3
1	RATED OUTPUT VOLTAGE	+5.0V	+11.75V	+30V
2	RATED OUTPUT CURRENT	0.5A	0.8A	0.5A
3	MAXIMUM LOAD CURRENT	0.8A	1.3A	0.76A
4	LOAD CHANGE RANGE	0.1 ~ 0.8A	0.03 ~ 1.3A	0.05 ~ 0.76A

6-4-3. Power Circuit

6-4-3-1 INPUT

This product is equipped with a three-wire grounding-type power inlet. Insulation is class 1.
When a power device part breaks down or some trouble in this circuit causes a short, excess current runs through a fuse and blows it to protect power devices and the system from excess current and prevent a fire.
Input filter of power input terminal removes line noise flown in from outside and reduces noise which is made in power circuit and logic part and conducted or radiated through power cords.
AC input voltage is rectified by bridge diode of full wave rectifier, is converted to DC voltage by smoothing circuit, and switches the power device of this voltage.

As switching is in RCC(Ringing Choke Converter) mode, switching frequency changes from about 50KHz to 100KHz.
PWM(Pulse Width Modulation) Control Circuit adjusts the duty of the switching device by sensing the change of output voltage, and protects this product from excess current by receiving signals from excess current detecting circuit.

6-4-3-2 DRIVING CIRCUIT (START-UP CIRCUIT)

If you insert a power plug into AC outlet, full-wave rectified DC output voltage is generated at input electrolysis condenser and supplied to the gate of a switching device through driving resistance. This voltage drives the switching device. Once it is driven, it continues to switch via PWM control circuit with power supplied by auxiliary coil Nb.

6-4-3-3 SWITCHING CIRCUIT (VOLTAGE STABILIZATION)

11.75V of 2nd voltage is detected by voltage detector and feeds back through photo coupler to 1st PWM Control Circuit signals compared by error amplifier. PWM Control Circuit controls the gate of power transistor according to the feedback voltage so as to supply load with stable output voltage.

6-4-3-4 OCP CIRCUIT (OVER CURRENT PROTECTIVE CIRCUIT)

If a short in secondary load terminal or a short inside power device causes excess current, power consumption increases. Then it increases current of power transistor.
The current of power transistor increases linearly when it is on. This current is detected by sensing resistance and is impressed to excess voltage protective circuit of PWM control circuit through RC integration circuit where over current protection is built in.
If this voltage becomes bigger than Vbe of excess current control transistor, the potential of power transistor gate falls immediately and it stops driving power transistor to protect it from excess current.

6-4-3-5 OVP CIRCUIT (OVER VOLTAGE PROTECTIVE CIRCUIT)

If the main power of power device 11.75V increases abnormally, this excess voltage is detected by OVP detecting circuit and 11.75V output terminal shifts to a state similar to
a short.
If 11.75V output terminal shorts, over current runs on over current detecting terminal and OCP circuit operates to prevent a fire in power device.

6-4-3-6 +5V OUTPUT TERMINAL

Square wave voltage generated by Ns1 produces DC voltage rectified and smoothed by half-wave rectifier. This voltage put in to a three-wire regulator generates stable DC power of +5V.

6-4-3-7 +30V OUTPUT TERMINAL

Square wave voltage generated by Ns2 is rectified and smoothed by half-wave rectifier and supplies load with output voltage without separate regulation.

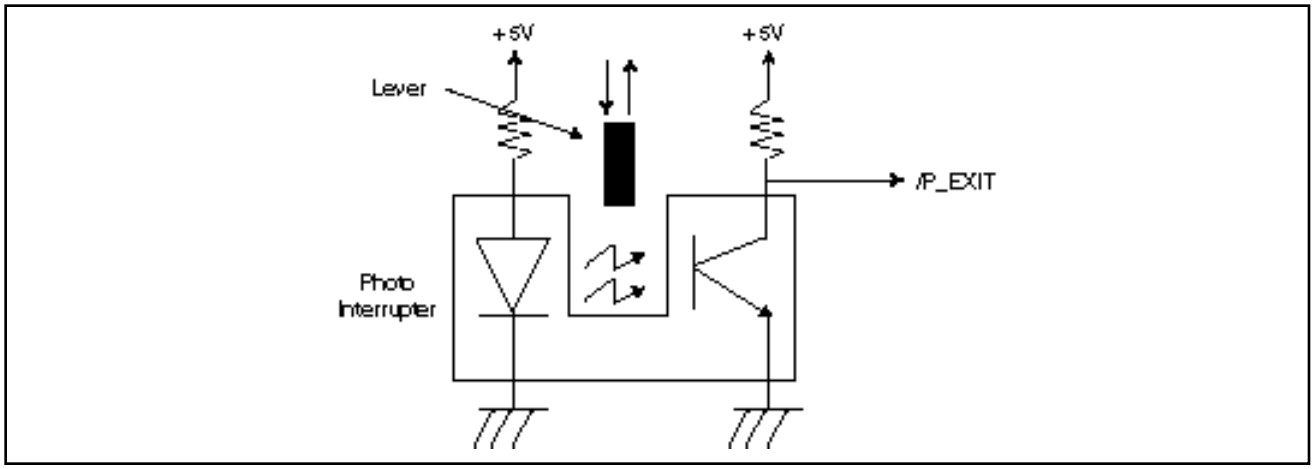
6-4-3-8 +11.75V OUTPUT TERMINAL

Square wave voltage generated by Ns3 is rectified and smoothed by half-wave rectifier, and then detected by voltage detector. Signals compared by error amplifier are fed back to primary PWM
control circuit through photo coupler.
PWM control circuit controls the voltage of power transistor gate driver according to the voltage to supply load with stable output voltage.

6-5. Others

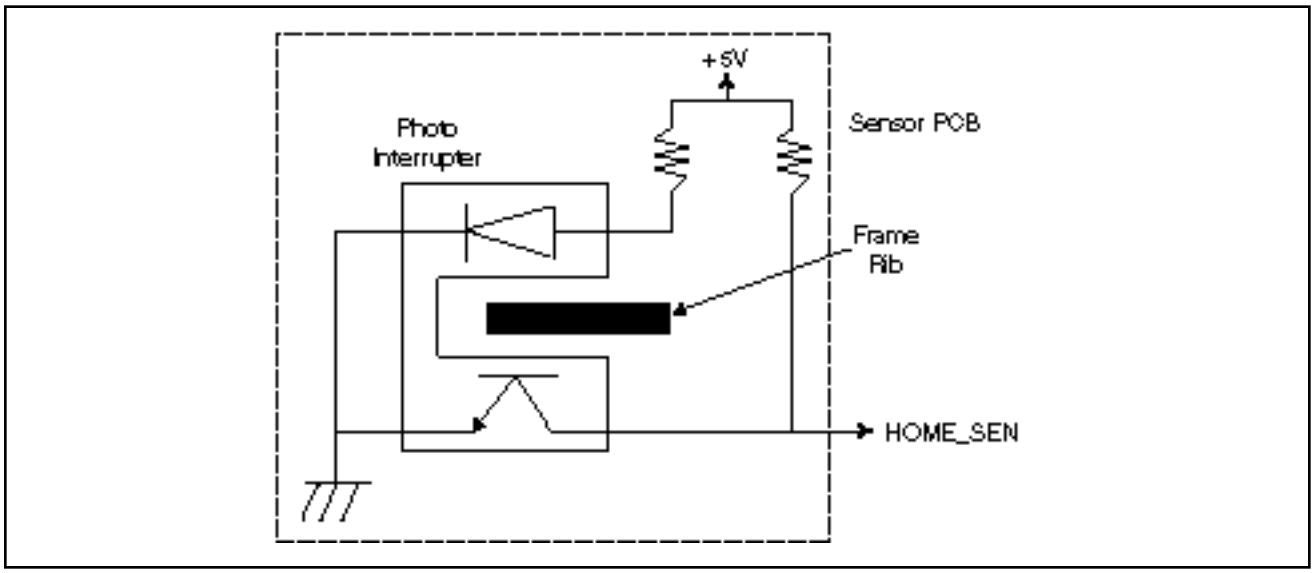
6-5-1. Paper Sensing Circuit

This circuit senses whether there is paper or not, using photo interrupter. If there is no paper, the lever will cover its sensor and output "/P_EXIT" will become "High". If there is paper, the lever will be lifted and output "/P_EXIT" will become "Low".



6-5-2. Home Sensing Circuit

This circuit senses whether carriage is at home or not. This function is carried out when the system is turned on or when the head is capped. Photo interrupter is used as a home detecting sensor, attached to the back of the carriage. When the carriage moves left and right, output is “high” if the frame rib covers the center of the sensor and “low” if it is out of home.



6-5-3 Temp IC Driving Circuit

TEMP IC(DC1621S, Thermometer) mounted on the sensor card on the back of the carriage is used to read the temperature around ink cartridge.
This IC converts the temperature around IC package into digital and sends the temperature data to serial to make it sense the temperature around the head. It senses temperature so that the temperature of the head can be the optimum when you print something. The above IC sends data serially using signal lines(THM_DATA, THM_CLK).

8. Troubleshooting

8-1 SCANNER

8-1-1. COPY

PROBLEM	ITEMS TO BE CHECKED	HOW TO SOLVE
White Copy	• Check shading profile. • Check white Ref. value and black Ref. value. • Check CIS signal input level.	• Remake shading profile in the tech mode. • Replace U17 if it is defective. (white Ref. =3.0V. black Ref=1.4V) • Check if it is 3.0V when operating and 1.5V when idle. If defective, replace CIS.
Black Copy	• Check shading profile. • Check if CIS LED is on/off. • Check white ref.value and black Ref.value. • Check CIS signal input level.	• Remake shading profile in the tech mode. • Check if CIS harness is pluged. • If defective, replace U17. (white Ref.=3.0V. black Ref=1.4V) • Check if it is 3.0V when operating and 1.5V when idle. If defective, replace CIS.
Defective image quality	• Check shading profile. • Check printing quality.	• Remake shading profile. • Refer to printing quality.

8-1-2. PC-SCAN

PROBLEM	ITEMS TO BE CHECKED	HOW TO SOLVE
Scanning error	• Check if printer cable is installed. • Check if printer cable is appropriate. • Check how TWAIN driver is installed. • Check parallel port I/P part. ① Check the early state of J2 print signals.: #1, 10-14, 31, 32, 36 ② Check U4 input/output signals. ③ Check input/output signals of U16-43 ~ 51, U16 - 53 ~ 61.	• Check if printer cable is correctly installed. • Check if printer cable is proper for IEEE1284. • Reboot the system after TWAIN driver is installed again. • Replace the main PBA.
Defective image quality	Refer to '1.COPY'.	Refer to '1.COPY'.

8-1-3 Service Mode

8-1-3-1 HOW TO ENTER SERVICE MODE

In service (tech) mode, the technician can check the machine and perform various test to isolate the cause of a malfunction.

To enter the service (tech) mode, press **MENU, #, 1, 9, 3, 4** in sequence, and the LCD briefly displays 'TECH', the machine has entered service (tech) mode. While in service (tech) mode, the machine still performs all normal operations. To return to normal user mode, press **MENU, #, 1, 9, 3, 4** in sequence again, or turn the power off, then on by unplugging and plugging the power cord.

Options changed while in service mode do not remain changed unless you clear the machine's memeory.

8-1-4 Setting-up System

8-1-4-1 Options

Options in User Mode	Item	Default Status
RINGER VOLUME	[LOW/MEDIUM/HIGH]	HIGH
HOME SETTING		
E RESOLUTION	[STANDARD/FINE/SUPER FINE]	FINE
E CONTRAST	[NORMAL/DARKEN/LIGHTEM/PHOTO]	MORMAL
Options in Tech Mode	**Item**	**Default Status**
MODEM TEST	FSK/2400/4800/7200/ 9600/12000/14400 bps	
DTMF TEST	1100/1650/1850/2100Hz	
ADJUST SCAN LED ON TIME		
RINGER VOLUME	[LOW/MEDIUM/HIGH]	HIGH
HOME SETTING		
E RESOLUTION	[STANDARD/FINE/SUPER FINE]	FINE
E CONTRAST	[NORMAL/DARKEN/LIGHTEN/PHOTO]	NORMAL
PROGRAM DOWNLOAD		

8-1-4-2 OPTIONS IN SYSTEM SETUP

MODEM TEST

The modem will send various transmit signals on the telephone line you can check the fallowing:

- FSK tect
- Tones : 1100Hz, 1650Hz, 1850Hz, 2100Hz
- G3 training : 14400, 12000, 9600, 7200, 4800, 2400bpi

DTMF

DTMF (Dual Tone Multiple Frequency) signal can be checked.

- 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, *, #

ADJUST SCAN LED ON TIME

- It is used to adjust the anount of light of CIS. It is already set at CIS LED ON TIME to get optimum quality.

WARNNING!
Shading profile MUST be made after Downloading a new Firmware. If not, system will not work properly.

ADJUST SEQUENCES

1. Load All White Document in scanner Unit
2. Enter 'Tech Mode'
3. Press MENU → 04(SYSTEM SETUP) → ✔ → ✔
4. LCD will display 'ADJUST SCAN LED ON TIME?'
5. Press 'START' then LCD will display 'SHADING..'
6. After scanning, Shading waveform will be printed out.
7. Press 'STOP'
8. Turn OFF system and Turn ON

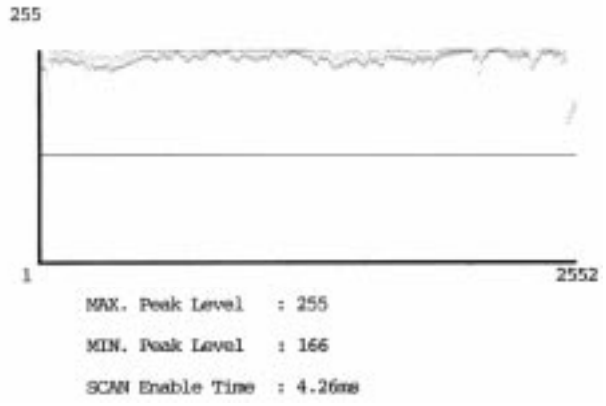


Fig.8-1-4-2-1 Mono Shading Waveform

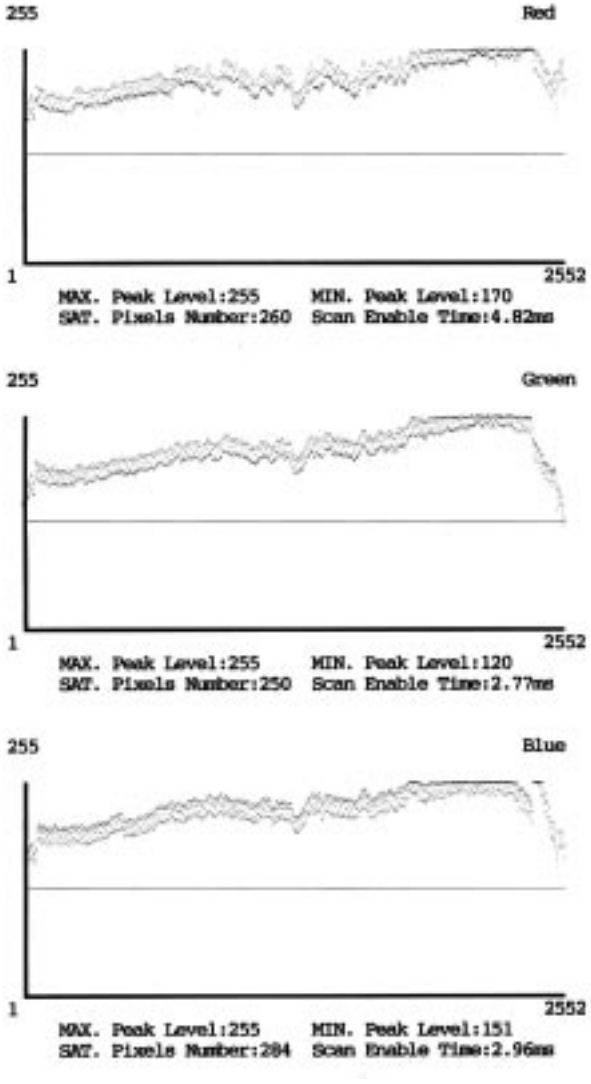


Fig.8-1-4-2-2 Color Shading Waveform

RINGER VOLUME

•Refer to User's Guide.

HOME SETTING

•Refer to User's Guide.

PROGRAM DOWNLOAD

• It is used to download ROM files into the machine using its flash ROM. If you download CIS or the main board again, you should adjust SCAN LED ON TIME.

• Download Sequences:

① Press the 'START' key in 'PROGRAM DOWNLOAD?' then the display shows 'ARE YOU SURE? 1. YES 2. NO'

② Press the 'I' key

③ Download ROM files from a PC that can be connected with Pallel cable (IEEE 1284).

8-1-5 Changing System data

8-1-5-1 Selectable System data

System data in User Mode	Item	Default Status
FAX PAPER SIZE	[LETTER/A4/LEGAL]	A4
MESSAGE CONFIRMATION REPORT	[ON/OFF/ERROR]	ON-ERROR
AUTO TX/RX REPORT	[ON/OFF]	OFF
REMOTE RCV MF CODE	[0-9]	*9*
DIAL MODE	[TONE/PLUSE]	TONE
ECM MODE	[ON/OFF]	ON
DIRECT COPY	[ON/OFF]	OFF
AUTO REDUCTION	[ON/OFF]	ON
E VERTICAL REDUCTION ONLY	[ON/OFF]	OFF
DISCARD SIZE	[0-30]	8mm
RETRY INTERVAL	[1-7]	3minutes
RETRY COUNT	[0-2]	2
AUTO RECEIVE ON RING COUNT	[1-7]	2
FORCED MEMORY TX	[ON/OFF]	OFF
RECEIVE TERMINAL ID.	[ON/OFF]	OFF
CONTINUOUS POLL REPORT	[ON/OFF]	OFF
FAX PRINT QUALITY	[LQ/DRAFT]	LQ
System data in Tech Mode	**Item**	**Default Status**
MODEM SPEED	[2400/4800/7200/9600/12000/14400]	14.4 KBPS
FAX TX LEVEL	[1-15]	–12dBm
FAX RX LEVEL	[40-50]	–43dBm
FLASH TIME	[100/280/600]	100ms
PAUSE TIME	[1-9]	4sec

8-1-5-2 SYSTEM DATA

MODEM SPEED

Default = 14400 bps

Select baud rate of 14400, 12000, 9600, 7200, 4800, or 2400 bps. The lower the baud rate, the larger the acceptable error rate. T30 protocol has a fixed speed of 300 bps in the protocol mode. When the TX speed is set to 14400 or 12000 bps, the RX speed will be either V.17 or V.33. When the TX speed is set to 9600 or 7200 bps, the RX speed will be either V.29 or V.27 ter. When the TX speed is set to 4800 or 2400 bps, the RX speed will be V.27 ter.

FAX TX LEVEL

Default = –12 dBm

FCC requires that the transmission level be less than –9 dBm. From –9 dBm to –15 dBm is acceptable. You can set the transmission level between 0 and –15 dBm in 1dBm steps using the control panel keypad. Accuracy is +0/–3 dBm.

FAX RX LEVEL

Default = –43 dBm

Reception level may be too low due to cable losses. If set to –43 dBm, reception sensitivity will be betWeen 0 and –43 dBm.

FLASH TIME

Default = 100 mseconds

Choose flash time 100/280/600 milliseconds.

PAUSE TIME

Default = 4.0 seconds

This sets the length of the pause time from 1 through 9 seconds, when the pause button is pressed.

8-1-5-3 CHANGING SYSTEM DATA

Press MENU and one-touch button 01 system data. Then press 1 to choose 'Tech'. Press ▲ or ▼ repeatedly to select the desired system data. When the desired system data appears, enter the corresponding information to change the status of the selected function. Press **STOP** to return to the date and time display.

PROBLEM	ITEMS TO BE CHECKED	HOW TO SOLVE
TEL LINE CANNOT BE ENGAGED (NO DIAL TONE)	• When you pick up the handset: ① Check line cord connection and P3(LIU) connection. ② Check hook switch of H/B Cradle and D2(LIU) connection. ③ Check the circuit around R2, Q1 and Q2 of LIU PBA. ④ Can't you hear dial tone though the line is engaged? • When you press "OHD" key: ① Check line cord connection. ② Check U7(main PBA), main LIU harness, and P1(LIU PBA). ③ Check relaying operation of LIU PBA : Is the control signal of U18-49(main) high?	• ① Insert it correctly into the connection jack called "line". ② Replace defective parts. ③ Replace LIU PBA. ④ Replace the handset. • ① Insert it correctly into the connection jack called "line". ② Replace defective parts. ③ Replace main PBA IF the control signal of U18-49(main) is low. Replace LIU PBA if high but phone line cannot be connected.
Cannot MF dial.	• Check U7(main PBA), main-LIU harness, and P1(LIU PBA) • Check signals of U16-122, 123.	• Replace defective parts. • Replace main PBA if the signals of U16-122(LIU_TXD) are abnormal. Replace LIU PBA if the signals of U16-123(LIU_RXD).
MF dial is possible but not DP dial.	• Check DP control signal of U3-27 of LIU PBA and the circuit around R2, Q1 and Q2. • Check connection of R43 of LIU PBA.	• Replace LIU PBA. • Replace LIU PBA.
Defective fax transmission	• Check U7(main PBA), main LIU harness, and P1(LIU PBA). • a Is the external phone hooked off? b Is the output of U2-4(LIU PBA) low? • Check 'hook off'. : Refer to 'TEL LINE CANNOT BE ENGAGED'. • Check the control signals of U15-122, 123. • Check transmission path.: Check output of U15-44(main PBA) and input of U3-3(LIU PBA). • Check reception path.: Check output of U3-40(LIU PBA) and input of U15-45(main PBA).	• Replace defective parts. • a Hook on the external phone correctly. b Replace LIU PBA if low. • Refer to 'TEL LINE CANNOT BE ENGAGED'. • Replace main PBA if the signals of U15-122 (LIU_TXD) are abnormal. Replace LIU PBA if the signals of U15-123 (LIU_RXD) are abnormal. • Replace main PBA, if abnormal. • Replace LIU PBA if the output of U3-40 (LIU PBA) is not confirmed. Check the circuit around U6 (main PBA) if the input of U21-45 (main PBA) is not confirmed though the output of U3-40 (LIU PBA) is confirmed.
Defective automatic fax reception	• Is the ring checked? Check ring pattern at U18-84(main PBA). • Refer to 'Defective Transmission'.	• Replace LIU PBA if it cannot be checked. • Refer to 'Defective Transmission'.

PROBLEM	ITEMS TO BE CHECKED	HOW TO SOLVE
ASF feeds paper but paper is not supplied to the engine.	• Check if actuator feed operates perfectly. • Check if paper sensor is normal.	• Replace actuator-feed, spring, or other defective parts. • Replace the paper sensor.
ASF cannot feed paper.	• Check if stopper clutch operates perfectly. • Check if too much paper has been supplied. • Check if pickup roller rubber of the ASF is worn out.	• Replace stopper clutch assembly. • Supply appropriate amount of paper(130 sheets of normal copying paper). • Replace pickup roller rubber.
Can't feed envelopes	• Check the location of the envelope guide of ASF.	• Open the envelope guide when you feed envelopes.
Tilted Printing	• Check if paper guide of the ASF is adjusted to the size of paper.	• Adjust paper guide to the size of paper.

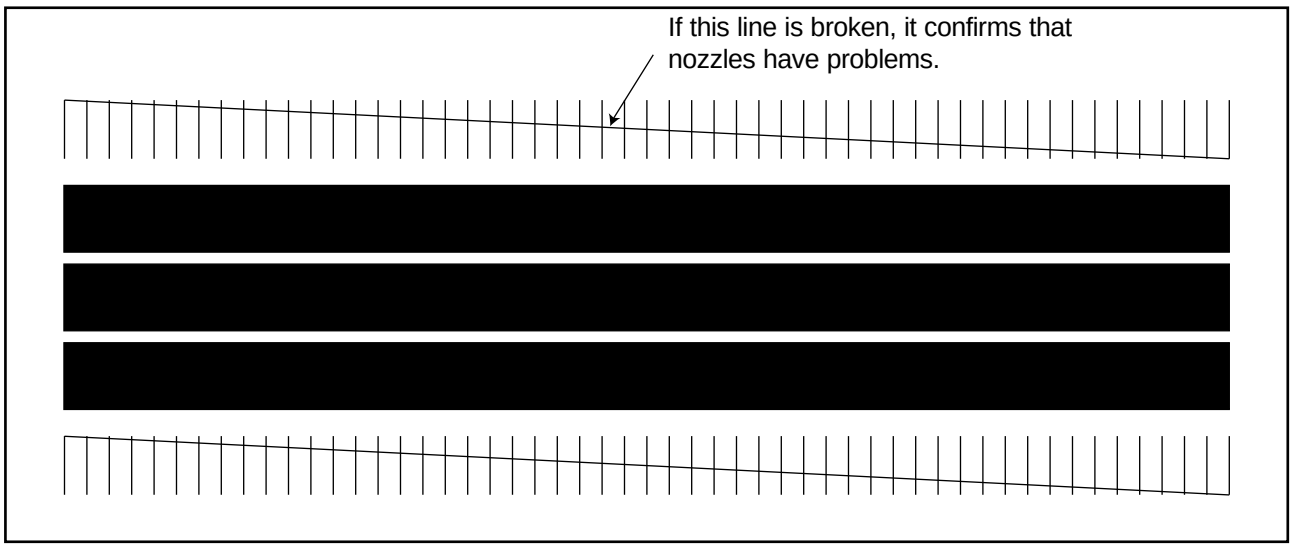
* ASF: Automatic Sheet Feeder

8-4-1 White lines on letters or graphics.

■ Cause

If nozzles in print head has a problem, white lines are marked on the print.

'Self-Test printing' will let you know if nozzles have fallen problems.



■ Solution

1) Run 'print control panel' to "clean cartridge" and check if nozzles have been blocked.
2) Wipe with soft cloth the contact surfaces of ink cartridge and carriage, and check if nozzles have been cleaned properly.
3) Separate ink cartridge from carriage and combine them. Repeat it about 5 to 6 times and check if connection is proper.
4) Replace ink cartridge and check whether there's a problem with thehead.
5) Check if head cable is inserted well into the main circuit board and then check if nozzles have problems.
6) Check if head cable is broken or torn and then check if nozzles have problems.
7) Replace the main circuit board with a new one and check if nozzles have problems.

8-4-2 When Vertical lines are printed crookedly

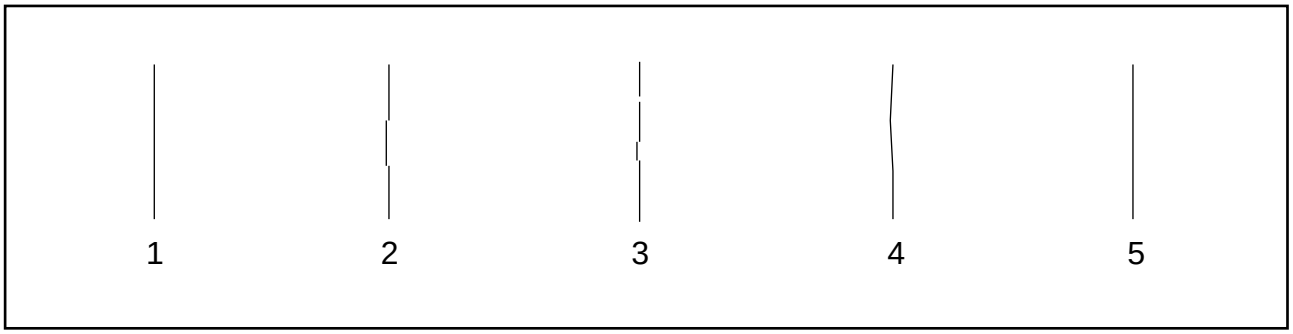
■ Cause : Vertical lines are printed crookedly if you do not “align Vertical lines” on the printer.

■ Solution

1) Run print control panel to “align Vertical lines”, and

2) Select the best one of the above samples and enter the number.

3) This function to align Vertical lines is available both for mono and color cartridges.



8-4-3 When ink spreads on transparent film

■ Cause : You selected a wrong medium on the driver or you did not use transparent film designated for inkjet.

■ Solution

1) Use only transparent film designated for inkjet when you print on transparent film by an inkjet printer.

2) Run “Windows driver” and select “transparent film” as the kind of paper if you print on Windows.

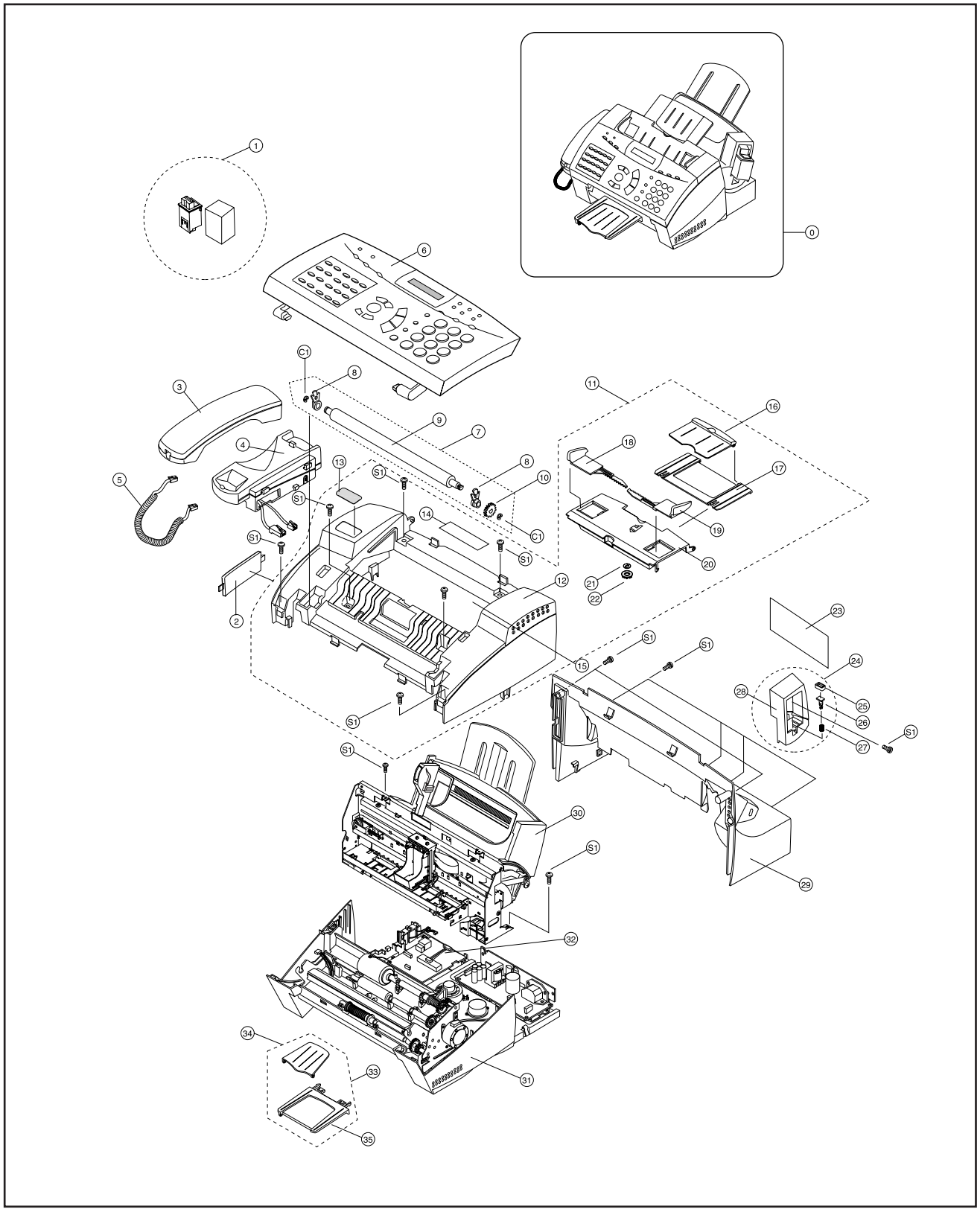
8-5. Defective Operation

PROBLEM	ITEMS TO BE CHECKED	HOW TO SOLVE
LCD does not display (operation panel)	• Powered up? • VCC(+5v) M+4.5V? • Is the level of U16-130(_POR) high (more than +4V)? • Check Main to OPE harness and J3(main). • Is the level of U16-153 (_RST_OUT) high (more than +4V)? • Is the level of U18-31 (_OPE_RST) high (more than +4V)? • Check control signals of U16-124, 125(OPE_TXD, OPE_RXD).	• Check power.(SMPS) a Check if the cord is connected. b Check each power channel. (+5V, +11.75V, +30V) • Check power harness. • Check the circuit around U103. • Replace defective parts. • Check the state of data bus of U16.: Replace the main PBA. • Check the circuit around U18. • If signals of OPE_TXD are defective, replace the main PBA. If signals of OPE_RXD is defective, replace OPE PBA.(Refer to circuit explanation.
Cannot enter by keys(operation panel)	• Refer to 4-7 of “LCD does not display”. • Check OPE key contacts.	• Refer to 4-7 of “LCD does not display”. • Replace OPE.
LF MOTOR does not operate.	• Check the control signals of U16-141~145. • Check input signals and driving output of U1 and U2.	• If control signals are not made when the other functions are normal, replace the main PBA. • If driving output is defective when input signals are normal, replace U1 and U2.
CR MOTOR does not operate.	• Check the control signals of U16-31~36. • Check input signals and driving output of U25 and U28.	• If control signals are not made when the other functions are normal, replace the main PBA. • If driving output is defective when input signals are normal, replace U25 and U28.
TX MOTOR does not operate.	• Check the operation of the document sensor of OPE PBA. • Check the operation of TX Motor. ① Check the control signals of U18-105~110. ② Check input signals and driving output of U23 and U24.	• If defective, replace the sensor. • ① If control signals are not made when the other functions are normal, replace the main PBA ② If driving output is defective when the other functions are normal, replace U23 and U24.
Paper Jam	• Check sheet feeder and ejector. • Check the operation of LF motor. • Check paper exit sensor.	• Get rid of jammed paper. • Refer to “LF motor does not operate.” • If the sensor senses paper exit when it operates normally, replace the main PBA.

PROBLEM	ITEMS TO BE CHECKED	HOW TO SOLVE
Document Jam	• Check document feeder. • Check the operation of TX motor. ① Check the control signals of U18-105~110. ② Check the input signals and driving output of U23 and U24.	• Remove jammed documents and insert it again. • ① If control signals are not made when other functions are normal, replace the main PBA ② If driving output is defective when input signals are normal, replace U23 and U24.
No Paper	• Paper Empty? • U18-48 is HIGH? (+4V or over)	• Feed paper. • If high, replace the paper empty sensor. If low, replace the main PBA.
No Document	• No document? • Check the document sensor of OPE PBA.	• Insert documents. • If high, replace the document sensor. If low, replace the OPE PBA.
No Cartridge	• Check if ink cartridge is installed. • Check contacted part of the head. • Check head checking circuit and driver.: Check U16-8,9,10,128,154,156, U18-103 control signals and head data.	• Insert ink cartridge. • Clean it. • Replace the main PBA.
Bad Cartridge	• Check if ink cartridge is defective. • Check the output level of U22-1.	• Replace ink cartridge. • If low, replace the main PBA.
Ink low	• Check the amount of ink.	• Replace ink cartridge using ‘cartridge’ key.
Can’t PRINT	• Check centronics cable connection. • Check what type of print driver has been installed. • Check I/F part of parallel port. ① Check the initial state of J2 print control signal of CON8.: No.1, 10 - 14, 31, 32, 36 ② Check input and output signal of U4. ③ Check input and output signals of U16-43 ~ 51 and U16-53 ~ 61.	• Connect it correctly. • Install the print driver again and reboot the system. • Replace the main PBA.

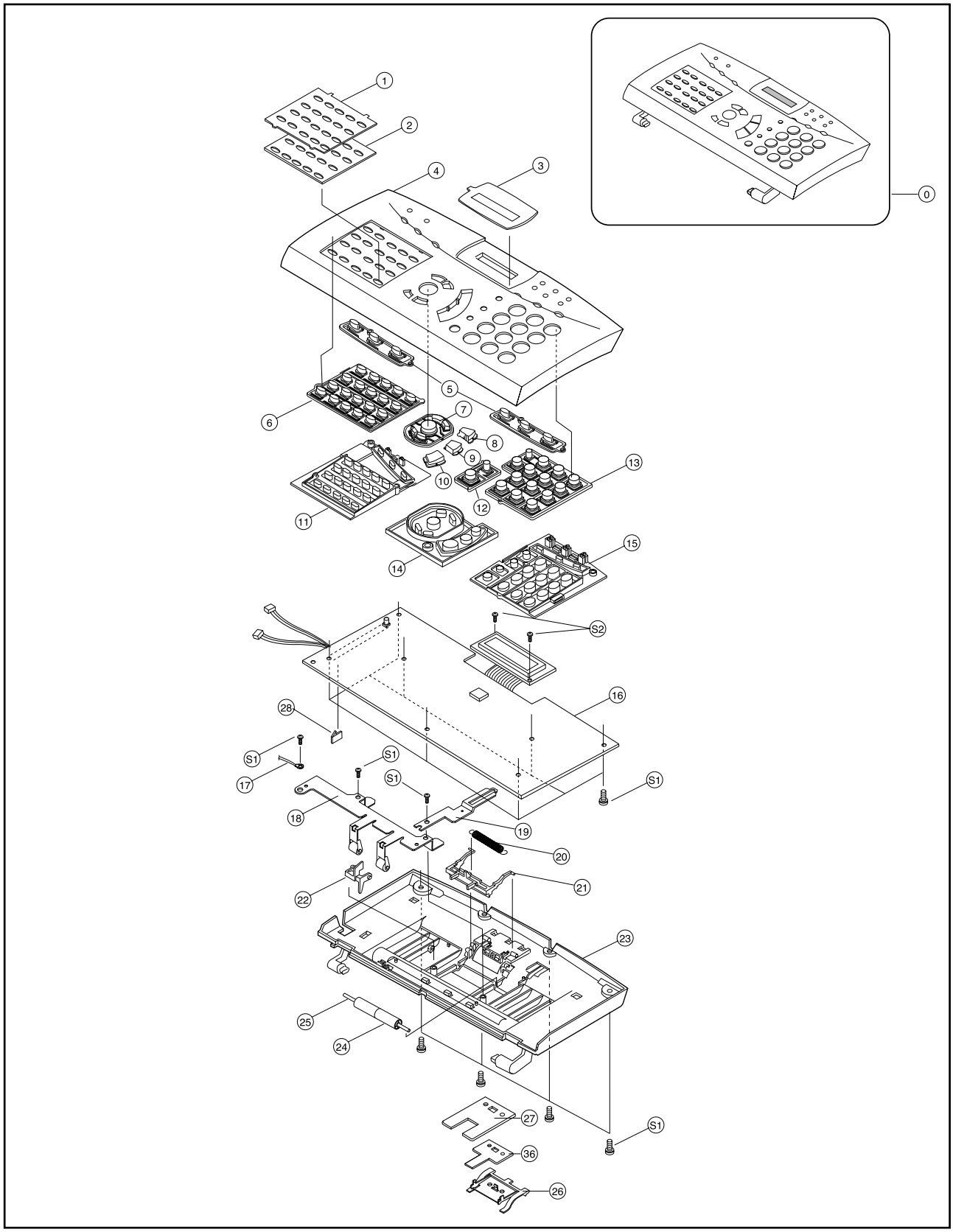
9. Exploded Views and Parts List

9-1 Main Assembly Parts



<Main Assembly Parts>

NO	DESCRIPTION	SEC CODE	Q'TY	AVALABLE SVC PART
0	SF-4500	SF-4500/XEU	1	
	Msys4700	SF-4500/XAR	1	
	MJ-4500	SF-4500M/XAR		
	SF-4500C	SF-4500C/XEU		
	Msys4800	SF-4500C/XAR		
	MJ-4500C	SF-4500MC/XAR		
1	UNIT-Cartridge(M)	JB59-10507A	1	v
	UNIT-Cartridge(C)	JB59-10504A	1	v
2	Dummy-Cradle	JG72-41081A	1	v
3	Unit-Handset	JG96-00680B	1	v
4	Unit-Cradle	JG96-00681B	1	v
5	Curl cord	JG39-60503A	1	v
6	Unit-OPE Ass'y	–	1	
7	White-Roller Ass'y	JG97-01035A	1	v
8	Bushing-White	JF72-41306A	2	
9	Roller-CIS	JG75-10546A	1	
10	Gear-Drive (B4)	JG72-40740A	1	
C1	Ring-C	6044-000159	2	
11	Top-Cover Ass'y	JG97-01029A	1	v
12	Cover-Top	JG72-41066A	1	
13	Label-Nameplate	JG71-10525A	1	
14	Label-Replace	JG68-10583A	1	
15	Label-Cleaning	JG68-30591A	1	
16	Dummy-Chute	JG72-41069A	1	
17	Chute	JG72-41068A	1	
18	Guide DOC L	JG72-41071A	1	
19	Guide DOC R	JG72-41070A	1	
20	Door	JG72-41067A	1	
21	Spring Curve	JG61-70004A	1	
22	Gear pinion	JG66-40003A	1	
23	Label-Serial	–	1	
24	Garage Ass'y	JB97-00925A	1	v
25	Rubber-Cap, Head	JB73-10903A	1	
26	Holder-Cap	JB72-40248A	1	
27	Spring-Cap	6107-000014	1	
28	Garage	JB72-40947A	1	
29	Cover-Rear	JG72-41073A	1	v
30	Unit-Engine	–	1	
31	Unit-Base Ass'y	–	1	
32	Harness-LIU	JG39-41012A	1	v
33	Stacker-Tx ass'y	JG75-10548A	1	v
34	Stacker-Tx(2)	JG72-41075A	1	
35	Stacker-Tx(1)	JG72-41074A	1	
36	Sheet-ADF	JB72-10908A	1	v
S1	Screw-Tapping, M3 × L8	6002-000175	11	v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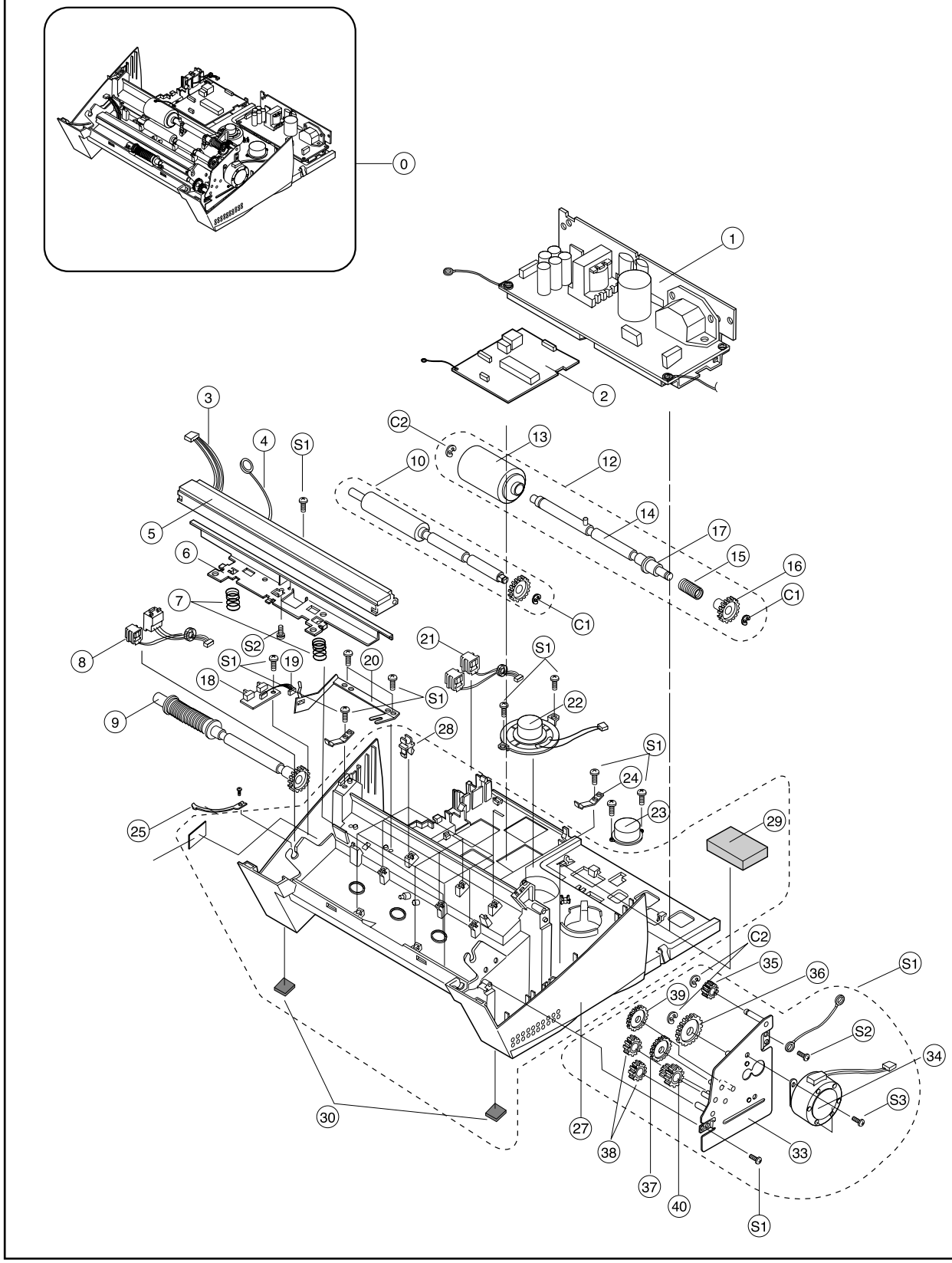
<Unit-OPE Ass'y>

NO	DESCRIPTION	SEC CODE	Q'TY	AVALABLE SVC PART
0	Unit-OPE Ass'y	–	1	
1	Cover-Address	JG74-10543A	1	v
2	Paper-Address	JG74-10544A	1	v
3	COVER-LCD	JG72-41054A	1	v (for Mono)
	COVER-LCD	JG72-41054B	1	v (for Color)
4	COVER-OPE	JG72-41065A	1	v
5	KEY-Mode	JG72-41063A	2	v
6	KEY-OT	JG72-41059A	1	v
7	KEY-SCROLL	JG72-41058A	1	v
8	KEY-STOP	JG72-41061A	1	v
9	KEY-COPY	JG72-41057A	1	v
10	KEY-START	JG72-41060A	1	v
11	Rubber-OT	JG73-40515A	1	v
12	KEY-OHD	JG72-41056A	1	v
13	KEY-TEL	JG72-40947B	1	v
14	Rubber-Scroll	JG73-40514A	1	v
15	Rubber-TEl	JG73-40513A	1	v
16	PBA-OPE	JG92-01020A	1	v (for Mono)
	PBA-OPE	JB92-00945A	1	v (for Color)
17	GND WIRE (OPE)	JG39-41016A	1	v
18	Spring-Pinch Ass'y	JG75-10550A	1	v
19	Ground-Sensor	JG71-10524A	1	v
20	Spring-Coil	JG70-40514A	1	v
21	Support-ADF	JG72-41083A	1	v
22	Lever-Sensor	JG72-40918A	1	v
23	Frame-Upper	JG72-41082A	1	v
24	Roll-Pinch	JG72-40663A	2	v
25	Shaft-Pinch	JG70-40521B	1	v
26	Holder-Rubber	JG72-40044A	1	v
27	Rubber-ADF	JG73-10003A	1	v
28	Cable-Clamp	6502-000121	1	v
S1	Screw-Taptite M3u8L	6002-000175	14	v
S2	Screw-Taptite M2.5u6L	6003-000193	2	v

9-3 Unit-Base Ass'y

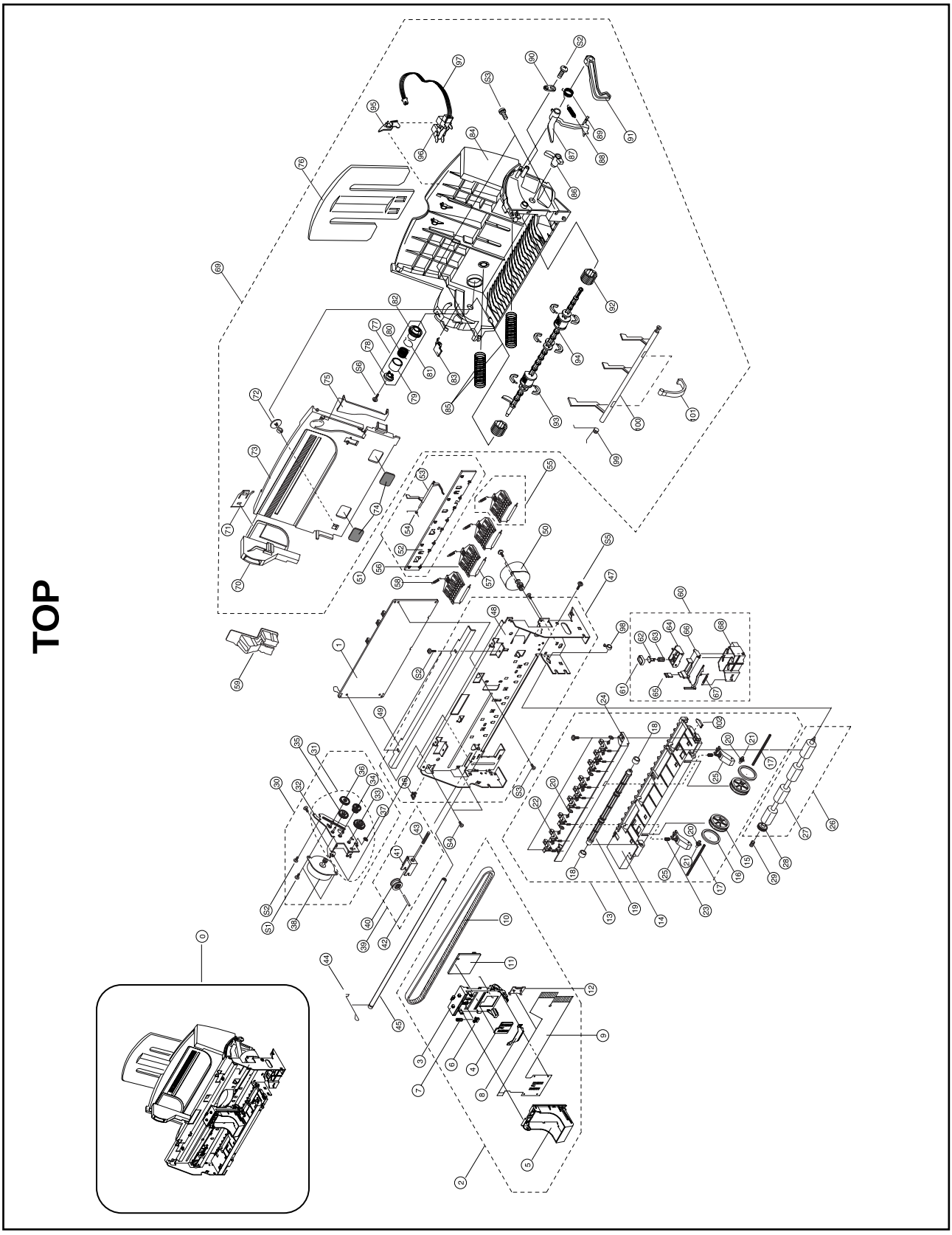


<Unit-Base Ass'y>

NO	DESCRIPTION	SEC CODE	Q'TY	AVALABLE SVC PART
0	Unit-Base Ass'y	–	1	
1	SMPS	JB44-10504A	1	v (for UK)
	SMPS	JB44-10503A	1	v (for USA)
2	LIU PBA	JG92-01031A	1	v
3	Harness CIS (M)	JG39-41017A	1	v
	Harness CIS (C)	JG39-41018A	1	v
4	Harness CIS GND	JG39-41025A	1	v
5	CIS (M)	0609-001030	1	v
	CSI (C)	0609-001062	1	v (for SF-4500C/Msys4800/MJ-4500C)
6	Bracket CIS (C)	JG70-10724A	1	v
	Bracket CIS (CC)	JG70-10725A	1	v (for SF-4500C/Msys4800/MJ-4500C)
7	Spring CIS (2)	JG61-70549A	2	v
8	Harness LIU/Cradle	JG39-41020A	1	v
9	Shaft Exit	JG72-40042A	1	v
10	Drive Roller Ass'y	JG97-01040A	1	v
11	Gear Drive (B4)	JG72-40740A	1	
C1	Ring-C (ID3)	6400-000159	1	
12	ADF Roller Ass'y	JG97-01039A	1	v
13	Roller ADF	JG75-10016A	1	
14	Shaft-ADF	JG70-40548A	1	
15	Spring-Clutch	JG70-40534A	1	
16	Gear-ADF	JG72-40659A	1	
17	Bushing-holder	JG72-40732A	1	
C1	Ring-C (ID3)	6044-000159	1	
C2	Ring-C (ID5)	6044-000156	1	
18	PBA-R/T/P		1	v (option)
19	Harness-LIU/RINGER		1	v (option)
20	Spring-GND	JG61-70547A	1	v
21	Harness-LIU/Modular	JG39-41023A	1	v (for UK)
	Harness-LIU/Modular	JG39-41021A	1	v (for USA)
22	Speaker Ass'y	JG96-01040A	1	v
23	Buzzer		1	v (option)
24	Locker-TX	JG64-30001A	2	v
25	TIE-Stopper	JG72-40717A	1	v
26	Cover-Base Ass'y	JG75-10547A	1	v
27	Cover-Base	JG72-41053A	1	
28	Bushing-TX(B4)	JG72-40744A	9	
29	Felt-Ink	JB74-10901A	1	
30	Foot-Rubber	JB61-40001A	2	
31	Sheet-Dummy	JG74-10009A	1	
32	Scan Motor Ass'y	JG96-01036A	1	v

<Unit-Base Ass'y (cont.)>

NO	DESCRIPTION	SEC CODE	Q'TY	AVALABLE SVC PART
33	Bracket-Motor	JG70-10723A	1	
34	Motor-Tx	3101-001120	1	
35	Gear-Spur	JG66-40001A	1	
36	Gear-17/35	JG66-40039A	1	
37	Gear-20/33	JG66-40038A	1	
38	Gear-Idle25	JG66-40036A	2	
39	Gear-17/35	JG66-40039A	1	
40	Gear-17/27	JG66-40037A	1	
C2	Ring-C (ID3)	6044-000159	2	
S1	Screw-Tapping, M3 u L8	6002-000175	13	v
S2	Screw-Tapping, M2.5 u L6	6003-000193	1	v
S3	Screw-Taptite, M3 u L6	6003-000269	2	v


TOP

<Engine-Ass'y>

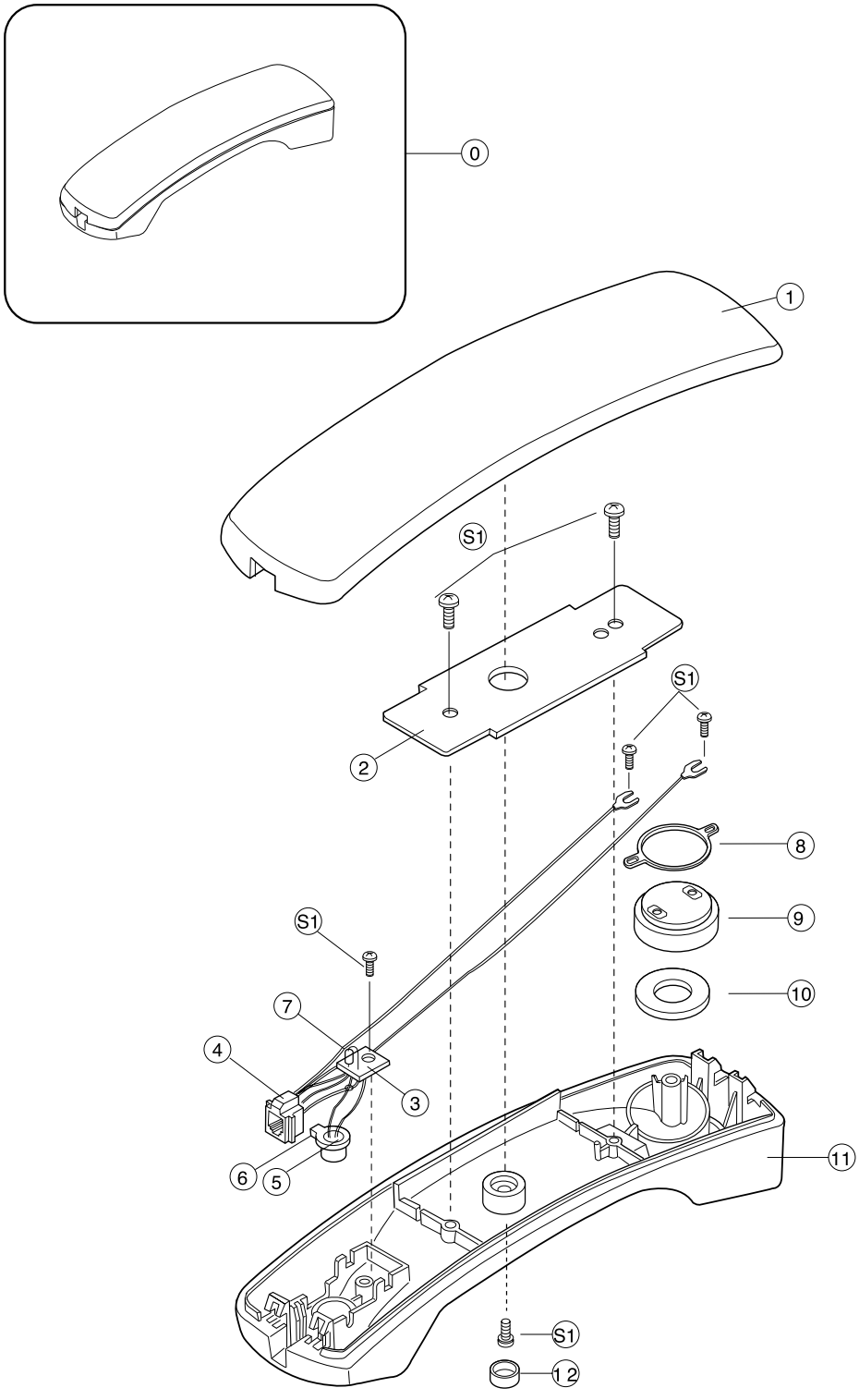
NO	DESCRIPTION	SEC CODE	Q'TY	AVALABLE SVC PART
0	Engine-Ass'y	–	1	
1	PBA-Main	JG92-01020A	1	v (Mono)
	PBA-Main	JB92-00945A	1	v (Color)
2	Carriage Ass'y	JB97-00933A	1	v
3	Frame-CR	JB72-40936A	1	
4	Rubber-Contact	JB73-10901A	1	
5	Craddle Head	JB72-40243A	1	v
6	Latch-Head	JB72-40244A	1	
7	Spring-CS	6107-000015	1	
8	Deflector-Guide	JB70-10904A	1	
9	Harness-FPC	JB39-40501A	1	v
10	Belt-Timing	JB66-20901A	1	v
11	PBA-SUB Sensor	JB92-00911A	1	
12	Holder FPC	JB72-00935A	1	
13	Frame Base Ass'y	JB97-01034A	1	v
14	Frame Base	JB72-40930A	1	
15	Pulley Exit	JB72-40934A	1	
16	Rubber Pulley	JB73-40902A	1	
17	Spring-Ring (0.5 DIA)	JB61-70906A	1	
18	Rex-Feed Exit	JB73-20901A	2	v
19	Roller Exit (9)	JB72-41207A	1	
20	Wheel Star (T)	JB70-10101A	11	
21	Holder Wheel	JB72-40237A	11	
22	Lever Exit	JB72-40933A	9	
23	Spring-CS (EXIT)	JB61-70907A	1	
24	Holder-Exit (11)	JG72-41087A	1	
25	Lever Exit (2)	JG72-41087A	2	
26	Roller-Feed Ass'y	JB97-00939A	1	v
27	Roller Feed	JB75-10926A	1	
28	Gear Feed	JB66-40001A	1	
29	Spring-ES (Damp)	6107-000003	1	v
30	MEA-BRKT LF1	JB97-00945A	1	v
31	BRKT-LF Ass'y	JB75-10934A	1	v
32	BRKT-LF MOTOR	JB70-10902A	1	
33	Gear-LF IDLE1	JB66-40002A	1	
34	Gear-LF IDLE2	JB66-40003A	1	
35	Gear-LF IDEL3	JB66-40902A	1	
36	Gear-LF IDEL4	JB66-40903A	1	
37	Bearing-Feed "L"	JB66-10001A	1	
38	Motor-Step (LF)	3101-001079	1	v
39	MEA-Pulley IDLE	JB97-00242D	1	v
40	Gear IDLE	JB66-40203A	1	
41	Holder Pulley	JB72-40283A	1	
42	Shaft Pulley	JB70-40100A	1	

<Engine-Ass'y (cont.)>

NO	DESCRIPTION	SEC CODE	Q'TY	AVALABLE SVC PART
43	Spring-CS (Pulley)	6107-001004	1	
44	Spring-CR Shaft	JB61-70007A	1	v
45	Shaft-CR	JB70-40901A	1	v
46	Cable Clamp	6502-000133	1	v
47	MEA-Frame Main	JB97-00935A	1	v
48	Frame Main	JB70-10901A	1	
49	Frame Rail	JB70-10002A	1	
50	Motor-CR	3101-001077	1	v
51	MEA-Roller SUB	JB97-00240A	1	v
52	Holder Roller	JB72-40232A	1	
53	Actuator feed	JB72-40236A	1	
54	Spring-Actuator	JB61-70004A	1	
55	MEA-Friction Roller	JB97-00938A	4	v
56	Holder Friction	JB72-40914A	4	
57	Roller Friction	JB70-40902A	4	
58	Spring-Friction	JB61-70902A	4	
59	Spacer ASF	JB72-10901A	1	v
60	MEA-Frame Home	JB97-00944A	1	v
61	Rubber Cap Head	JB73-10903A	1	
62	Holder-Cap	JB72-40248A	1	
63	Spring CS (Cap)	6107-000014	1	
64	Guide-Cap	JB72-40940A	1	
65	Rubber-wipe head	JB73-10902A	1	
66	Guide wiper	JB72-40938A	1	
67	Spring-Lever	JB61-70908A	1	
68	Frame-Home	JB72-40937A	1	
69	MEA-ASF Ass'y	JG97-01032A	1	v
70	Guide Paper side	JB72-40918A	1	v
71	Guide Latch	JB70-10906A	1	
72	Lever damper	JB72-40950A	1	
73	Plate-knock up	JB72-40917A	1	
74	MMP-Pad : Cork	829-492001A	1	
75	Guide-Envelope	JB72-40951A	1	v
76	Guide-Extension A	JB72-40218A	1	v
77	MEC-CLUTH	JB75-10931A	1	v
78	Hub-CLUTH	JB72-40927A	1	
79	RATCHET-CLUTH	JB72-40928A	1	
80	Spring-CLUTH	JB61-70904A	1	
81	Spring-RATCHET	JB61-70905A	1	
82	Gear-CLUTH	JB66-40901A	1	
83	Stopper-CLUTH	JB39-40929A	1	v
84	Frame-ASF	JB72-40915A	1	
85	Spring-Knock up	6107-000010	2	

<Engine-Ass'y (cont.)>

NO	DESCRIPTION	SEC CODE	Q'TY	AVALABLE SVC PART
86	Cam-pick up	JB72-40926A	1	
87	FINGER-ASF	JB72-40923A	1	
88	Spring-FINGER	6107-000011	1	
89	Spring-FINGER LEVER	JB61-70903A	1	
90	Bracket-FINGER	JB70-10903A	1	
91	Lever-FINGER	JB72-40924A	1	
92	Rubber-Pick Up	JB73-40901A	2	
93	Roller-Idle	JB72-40925A	6	
94	Shaft-Pick Up	JB72-40921A	1	
95	Actuator PE	JB72-40958A	1	
96	Photo-Interrupter	0604-001050	1	
97	Harness-PES	JB39-40504A	1	
98	Bearing-Feed "R"	JB66-10002A	1	v
99	Spring-Return Lever	JB61-70935A	1	
100	Lever-Return	JB72-41155A	1	
101	Bushing-Lever	JB72-41156A	2	
102	Guide-Edge	JG72-41094A	1	v
S1	Screw-Taptite, M3 u L6	6003-000126	2	v
S2	Screw-Taptite, M3 u L6	6003-000179	3	v
S3	Screw-Taptite, M3	6002-001016	3	v
S4	Screw-Machine, M3 u L6	6001-000131	2	v
S5	Screw-Taptite, M3	6003-000269	2	v
S6	Screw-Taptite, M2.5 u L6	6003-000193	1	v


0
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S1
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S1
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S1
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S1
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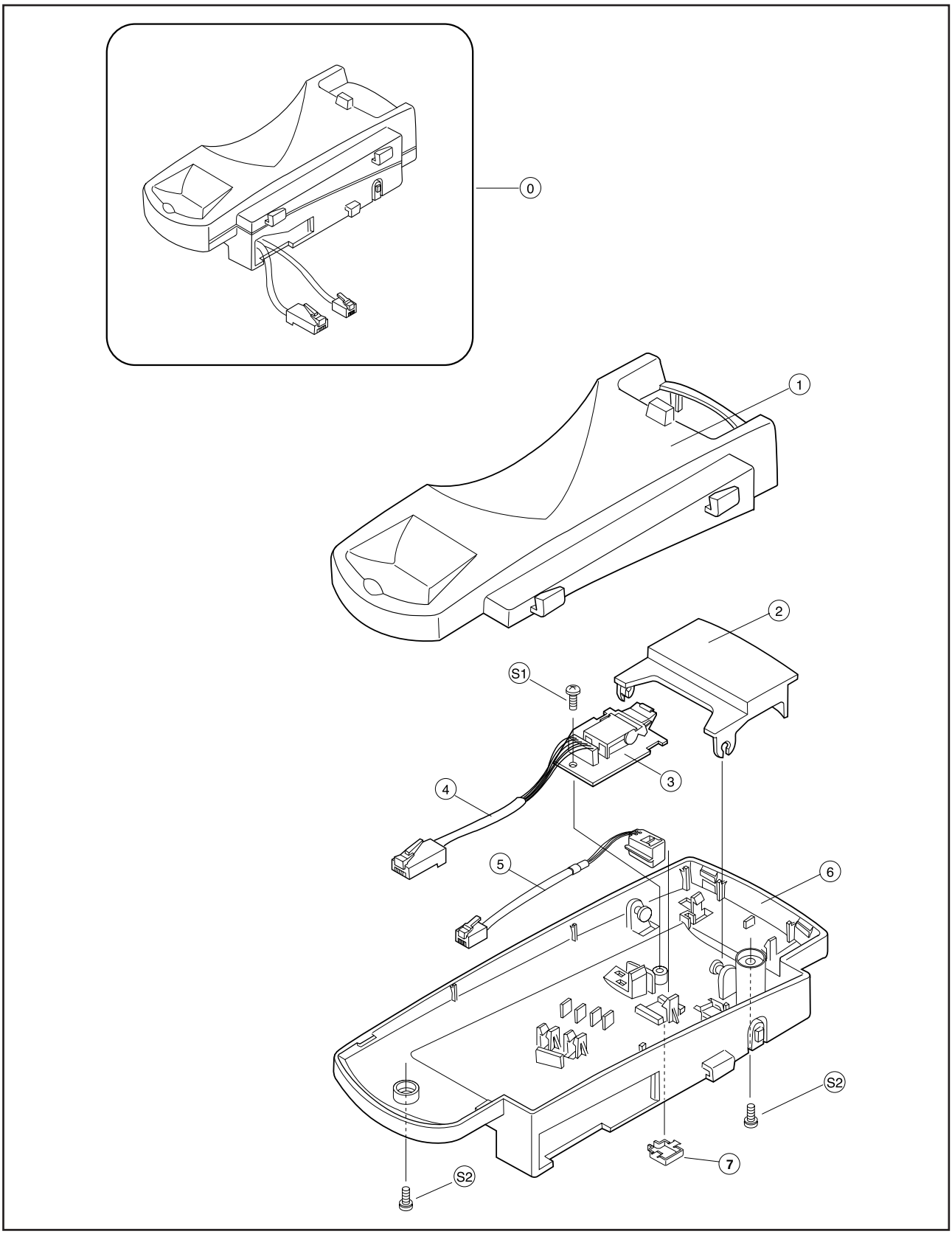
<Unit Handset>

NO	DESCRIPTION	SEC CODE	Q'TY	AVALABLE SVC PART
0	Unit-Handset	JG96-00680B	1	v
1	Handset-Upper	JG72-40942B	1	
2	Weight-balance	JG70-10694A	1	
3	PBA-Hook	JF92-00682A	1	
4	Harness, CBF-JACK	JF39-41070A	1	
5	MIC-CONDENSOR	3003-000102	1	
6	RMO-Rubber MIC	JG73-40508A	1	
7	DIODE-Zener	0403-000142	1	
8	Unit-Fixing	GB70-10500A	1	
9	Audio-Receiver	3009-00101	1	
10	RING-op	6044-000138	1	
11	Handset-Lower	JG72-40943B	1	
12	Hole-dummy	JF73-40512C	1	
S1	Screw-Taptite(M3u8L)	6003-000168	6	

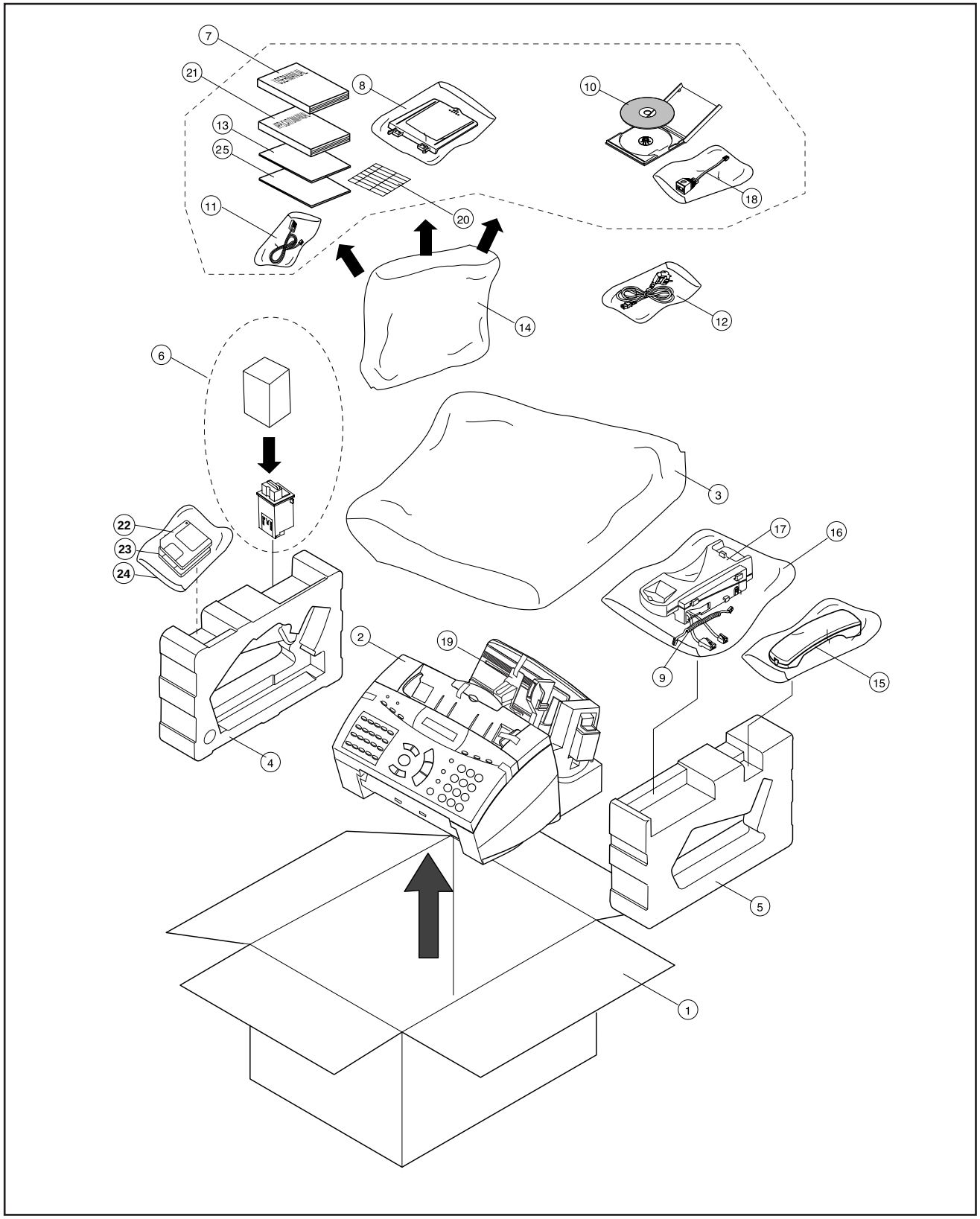
9-6 Unit-Cradle



<Unit Cradle>

NO	DESCRIPTION	SEC CODE	Q'TY	AVALABLE SVC PART
0	Unit-Cradle	JG96-00681B	1	v
1	Cradle-Upper	JG72-40944B	1	
2	Cover-Hook	JG72-40946B	1	
3	Hook-PBA	JG92-00587A	1	
4	LINE-CO(210mm)	JG39-50504A	1	IVORY
5	LINE-CO(170mm)	JG39-50503A	1	BLK
6	Cradle-Lower	JG72-40945B	1	
7	Cradle Cap	JB72-41234A	1	
S1	Screw-Taptite(M3 u L6)	6003-000165	1	
S2	Screw-Taptite(M3 u L8)	6003-000168	2	

10. Packing Diagram and Parts List



<Package>

NO	DESCRIPTION	SEC CODE	Q'TY	AVALABLE SVC PART
1	Box(p)-Master	JG69-10552A	1	v (for SF-4500)
		JB69-10961A	1	v (for SF-4500C)
		JG69-10552C	1	v (for Msys4700)
		JG69-10552D	1	v (for Msys4800)
		JB69-10970A	1	v (for MJ-4500C)
2	SF-4500	SF-4500/XEU	1	
	Msys4700	SF-4500/XAR	1	
	SF-4500C	SF-4500C/XEU	1	
	Msys4800	SF-4500C/XAR	1	
	MJ-4500C	SF-4500CM/XAR	1	
3	BAG-SET	JG69-30508A	1	v
4	Cushion "L"	JG69-20524A	1	v
5	Cushion "R"	JG69-20524A	1	v
6	Unit-Cartridge (M)	JB59-10507A	1	v
	Unit-Cartridge (C)	JB59-10504A	1	v
7	User's Manual	JB68-60948A	1	v
8	Stacker-Tx Ass'y	JG75-10548A	1	v
9	CurL cord	JG39-30503A	1	v (for UK)
	CurL cord	JF39-60001A	1	v (for USA)
10	CD-ROM	JB46-10529B	1	v
11	LINE-CORD	JF39-50054B	1	v (for UK)
	LINE-CORD	JF39-50094B	1	v (for USA)
12	POWER-CORD	GA39-10100A	1	v
13	Man (card)-BITS	JF68-70652B	1	v
14	BAG-Accessory	JG69-30510A	1	v
15	Handset	JG96-00680B	1	v
16	BAG-Cradle	JF69-30501F	1	v
17	Cradle	JG96-00681B	1	v
18	Tam Cord	JF39-50079A	1	v (UK only)
19	Spacer ASF	JB72-10901A	1	v
20	Paper Address	JG74-10544A	1	v
21	Application Manual	JB68-60956A	1	v
22	WinFax LITE 4.0 Disk 1	JG46-10021B	1	v
23	WinFax LITE 4.0 Disk 2	JG46-10030B	1	v
24	BAG-ZIPPER	JG69-30200A	1	v
25	Winfax Manual	JB68-60936A	1	v

11. Electrical Parts List

11-1 SF-4500/Msys4700/MJ-4500 Main B'd Parts List (Not Fixed)

NO	SEC CODE	DESCRIPTION	PART NUMBER	VENDER	Q`TY	REFERENCE
1	0401-000116	DIODE-SWITCHING, MMSD914T1, 100V, 200mA, 225mW, 4nS	MMSD914T1	MOT	3	D103, D104, D106
2	0401-001003	DIODE-SWITCHING, MMBD6050LT1, 70V, 200mA, 225mW, 4n	MMBD6050LT1	MOT	2	D109, D110
3	0402-000199	DIODE-RECTIFIER, EGL41B, 100V, 1A, DO-213AB	EGL41B	GI	1	D111
4	0403-000287	DIODE-ZENER, MMBZ5251B, 22V, 5%, 225mW, SOT-23	MMBZ5251	MOT, MATSU	1	ZD101
5	0404-000112	DIODE-SCHOTTKY, RB420D, 25V, 100mA, SOT-23	RB420D T147	ROHM	3	D105, D107, D108
6	0407-001008	DIODE-ARRAY, DA204K, 20V, 100mA, C2-3, SOT-2	DA204K	ROHMK	2	D101, D102
7	0501-000279	TR-SMALL, KSA1182-Y, PNP, 150mW	KSA1182-Y	SEC	1	Q4
8	0501-000342	TR-SMALL SIGNAL, KSC1623-Y, NPN, 200mW, SOT-23	KSC1623-Y	SEC	2	Q5, Q101
9	0501-000415	TR-SMALL SIGNAL, KSP56, PNP, 625mW, TO-92	KSP56	SEC	1	Q6
10	0501-000457	TR-SMALL SIGNAL, MMBT2222A, NPN, 225mW, SOT-23	KST2222A-TF	SEC, MOT	6	Q2, Q102, Q103, Q105, Q106, Q107
11	0501-000462	TR-SMALL SIGNAL, MMBT2907A, PNP, 225mW, SOT-23	KST2907A	SEC, MOT, PHI	1	Q104
12	0503-000129	TR-DARLINGTON, TIP112, NPN, 2W, TO-220AB	TIP112	SEC	1	Q7
13	0604-001033	PHOTO-INTERRUPTER	GP1S523	SHARP	1	S1
14	0801-000379	IC-CMOS LOGIC, 74HC00, NAND GATE, SOP, 14P, 150MIL	GD74HC00D/RT	LGS, PHI, TI	1	U101
15	0801-000387	IC-CMOS LOGIC, 74HC08, AND GATE, SOP, 14P, 150MIL	MC74HC08AD	MOT, HARRI	1	U3
16	0801-000794	IC-CMOS LOGIC, 7S08, AND GATE, SOP, 5P, 64MIL	TC7S08FUTE85L	TSB	1	U105
17	0803-000916	IC-TTL, 74LS245, TRANSCEIVER, SOP, 20P, 300MIL	SN74LS245DW	MOT.NSC	1	U4
18	0909-000101	IC-REAL TIME CLOCK, 4513, SOP, 14P, 300MIL, 0.032MHz	RTC-4513	EPSON	1	U102
19	1001-000170	IC-ANALOG SWITCH, MC14051BD, SPDT CMOS, SOP, 16P	MC14051BD	MOT	1	U11
20	1001-000171	IC-ANALOG SWITCH, MC14053BD, SPDT CMOS, SOP, 16P, 150MIL	MC14053BD	MOT	1	U9
21	1003-000243	IC-MOTOR DRIVER, PBL3717A, DIP, 16P, 300MIL	PBL3717A	SGS	4	U1, U2, U23, U24
22	1003-001102	IC-MOTOR DRIVER, TEA3718DP, DIP, 16P, 300MIL	TEA3718DP	SGS	2	U25, U28
23	1003-001137	IC-SOURCE DRIVER, HD8, CD1603, SOP, 24P	CD1603(R)	PHI	2	U32, U33
24	1003-001138	IC-SOURCE DRIVER, HD7, CD1602, SOP, 20P	CD1602(R)	PHI	2	U26, U27
25	1105-001030	IC-DRAM, 416C1200, 1Mu16BIT, SOJ, 42P, 400MIL	KM416C1200BLJ-6	SEC	2	U6, U8(option)
26	1106-000197	IC-SRAM, 62256B, 32K*8BIT, SOP, 28P, 450MIL	KM62256BLG-10	SEC	1	U14
27	1106-001012	IC-SRAM, 68257, 32Ku8BIT, SOJ, 28P, 300MIL	KM68257CJ-15	SEC	1	U21
28	1107-001081	IC-FLASH MEMORY, 29F400, 256Ku16BIT, SOP, 48P, 600MIL	AM29F400BB-70EC	AMD	1	U5
29	1201-000105	IC-AUDIO AMP, 34119, SOP, 8P, 150MIL, SINGLE	MC34119DR2	MOT	1	U10
30	1201-000167	IC-OP AMP, 358, SOP, 8P, 150MIL, DUAL, 100V/mV	KA358D-T/F	SEC	4	U12, U13, U17, U20
31	1201-001052	IC-OP AMP, 14577, SOP, 8P, 150, DUAL, -, PLASTI	MC14577CFR2	MOT	1	U19
32	1202-000170	IC-VOLTAGE COMP, 339, SOP, 14P, 150MIL, QUAD, 36V	KA339D	SEC, PHI	1	U22
33	1203-000623	IC-VOL. DETECTOR, 7045, SOT-89, 3P, -, PLASTIC	KIA7045F	KEC	1	U103
34	1205-001134	IC-MODEM, KS16117Q, QFP, 100P, -, PLASTIC, 5V	KS16117Q	SEC	1	U15
35	2001-000202	R-CARBON, 0.5ohm, 5%, 1/2W, AA, TP, 3.3u9mm	CR1/2W, 0.5, J	ABCO	6	R1, R2, R12~R15
36	2007-000023	R-CHIP, 120ohm, 5%, 1/10W, DA, TP, 2012	RC2012J121CS	SEM, ROHMK	1	R102
37	2007-000026	R-CHIP, 200ohm, 5%, 1/10W, DA, TP, 2012	RC2012J201CS	SEM, ROHMK	3	R110, R112, R147
38	2007-000028	R-CHIP, 39ohm, 5%, 1/10W, DA, TP, 2012	RC2012J390CS	SEM, ROHMK	8	R106, R108, R109, R113, R114 R117, R118, R121
39	2007-000028	R-CHIP, 39ohm, 5%, 1/10W, DA, TP, 2012	RC2012J390CS	SEM, ROHMK	6	R123, R125, R126, R129, R143, R307
40	2007-000029	R-CHIP, 0ohm, 5%, 1/10W, DA, TP, 2012	RC2012J000CS	SEM, ROHMK	4	R165, R181, R223, R322
41	2007-000223	R-CHIP, 1.2Kohm, 5%, 1/8W, DA, TP, 3216	RC3216J122CS	SEM, ROHMK	1	R278
42	2007-000238	R-CHIP, 1.5Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F1501CS	SEM, ROHMK	4	R156, R196, R251, R296
43	2007-000245	R-CHIP, 1.5Kohm, 5%, 1/8W, DA, TP, 3216	RC3216J152CS	SEM, ROHMK	1	R312

<SF-4500/Msys4700/MJ-4500 Main B'd Parts List (cont.)>

NO	SEC CODE	DESCRIPTION	PART NUMBER	VENDER	Q`TY	REFERENCE
44	2007-000282	R-CHIP, 100Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J104CS	SEM, ROHMK	5	R170, R176, R178, R224 R249
45	2007-000285	R-CHIP, 100Kohm, 5%, 1/8W, DA, TP, 3216	RC3216J104CS	SEM, ROHMK	2	R272, R283
46	2007-000290	R-CHIP, 100ohm, 5%, 1/10W, DA, TP, 2012	RC2012J101CS	SEM, ROHMK	10	R215, R217, R218, R220, R252, R256, R279, R280, R281, R282
47	2007-000290	R-CHIP, 100ohm, 5%, 1/10W, DA, TP, 2012	RC2012J101CS	SEM, ROHMK	7	R288, R292~R295, R298, R299
48	2007-000290	R-CHIP, 100ohm, 5%, 1/10W, DA, TP, 2012	RC2012J101CS	SEM, ROHMK	7	R300, R301, R308, R309, R310, R311, R313
49	2007-000297	R-CHIP, 10Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F1002CS	SEM, ROHMK	5	R103, R245, R253, R297, R306
50	2007-000300	R-CHIP, 10Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J103CS	SEM, ROHMK	8	R152, R167, R183, R188, R195, R201~R203
51	2007-000300	R-CHIP, 10Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J103CS	SEM, ROHMK	10	R205~R207, R225, R247, R315~R318, R319
52	2007-000325	R-CHIP, 118Kohm, 1%, 1/10W, DA, TP, 2012	RC2012J1183CS	SEM	1	R177
53	2007-000395	R-CHIP, 150Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J154CS	SEM, ROHMK	2	R166, R174
54	2007-000406	R-CHIP, 15Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F1502CS	SEM, ROHMK	1	R243
55	2007-000409	R-CHIP, 15Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J153CS	SEM, ROHMK	1	R287
56	2007-000444	R-CHIP, 180Kohm, 5%, 1/10W, DA, TP, 2012	MCR10EZHJ184	ROHMK	2	R171, R189
57	2007-000449	R-CHIP, 180ohm, 5%, 1/10W, DA, TP, 2012	RC2012J181CS	SEM, ROHMK	2	R208, R209
58	2007-000465	R-CHIP, 1Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F1001CS	SEM, ROHMK	5	R226, R228, R242, R244, R286
59	2007-000468	R-CHIP, 1Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J102CS	SEM, ROHMK	8	R101, R115, R116, R119, R120, R122, R124, R127
60	2007-000468	R-CHIP, 1Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J102CS	SEM, ROHMK	7	R128, R131, R133, R137, R150, R158, R163
61	2007-000468	R-CHIP, 1Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J102CS	SEM, ROHMK	4	R234, R260, R262, R263
62	2007-000468	R-CHIP, 1Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J102CS	SEM, ROHMK	5	R267, R269, R271, R285, R303
63	2007-000477	R-CHIP, 1Mohm, 5%, 1/10W, DA, TP, 2012	RC2012J105CS	SEM, ROHMK	2	R148, R182
64	2007-000508	R-CHIP, 2.4Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F2401CS	SEM, ROHMK	1	R229
65	2007-000542	R-CHIP, 200ohm, 5%, 1/8W, DA, TP, 3216	RC3216J201CS	SEM, ROHMK	3	R241, R275, R277
66	2007-000551	R-CHIP, 20ohm, 5%, 1/10W, DA, TP, 2012	RC2012J200CS	SEM, ROHMK	1	R199
67	2007-000565	R-CHIP, 220Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J224CS	SEM, ROHMK	2	R186, R197
68	2007-000586	R-CHIP, 22Kohm, 5%, 1/10W	RC2012J223CS	SEM, ROHMK	1	R168
69	2007-000671	R-CHIP, 2Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J202CS	SEM, ROHMK	3	R135, R211, R255
70	2007-000703	R-CHIP, 3.6Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J362CS	SEM, ROHMK	2	R136, R268
71	2007-000705	R-CHIP, 3.6Kohm, 5%, 1/8W, DA, TP, 3216	RC3216J362CS	SEM, ROHMK	1	R291
72	2007-000728	R-CHIP, 300ohm, 5%, 1/10W, DA, TP, 2012	RC2012J301CS	SEM, ROHMK	1	R190
73	2007-000738	R-CHIP, 30Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J303CS	SEM, ROHMK	2	R149, R192
74	2007-000757	R-CHIP, 330Kohm, 5%, 1/10W	RC2012J334CS	SEM, ROHMK	4	R179, R186, R323, R324
75	2007-000766	R-CHIP, 330ohm, 5%, 1/10W, DA, TP, 2012	RC2012J331CS	SEM, ROHMK	2	R265 R276
76	2007-000791	R-CHIP, 36.5Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F3652CS	SEM, ROHMK	1	R194
77	2007-000814	R-CHIP, 39.2Kohm, 1%, 1/8W, DA, TP, 3216	RC3216F3922CS	SEM, ROHMK	1	R238
78	2007-000844	R-CHIP, 3Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J302CS	SEM, ROHMK	4	R139, R172, R193, R270
79	2007-000872	R-CHIP, 4.7Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J472CS	SEM, ROHMK	4	R153, R169, R200, R305
80	2007-000920	R-CHIP, 47.5Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F4752CS	SEM, ROHMK	1	R191

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81	2007-000941	R-CHIP, 47Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J473CS	SEM, ROHMK	7	R138, R151, R180, R235, R250, R266, R274
82	2007-000964	R-CHIP, 5.1Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J512CS	SEM, ROHMK	8	R105, R107, R111, R134, R144, R146, R231, R232
83	2007-000964	R-CHIP, 5.1Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J512CS	SEM, ROHMK	3	R248, R259, R264
84	2007-000981	R-CHIP, 5.6Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J562CS	SEM, ROHMK	2	R210, R227
85	2007-000998	R-CHIP, 510ohm, 1%, 1/10W, DA, TP, 2012	RC2012F5100CS	SEM, ROHMK	3	R104, R257, R304
86	2007-001013	R-CHIP, 51ohm, 5%, 1/10W, DA, TP, 2012	RC2012J510CS	SEM, ROHMK	1	R320
87	2007-001039	R-CHIP, 56Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J563CS	SEM, ROHMK	7	R130, R132, R246, R261, R273, R284, R302
88	2007-001055	R-CHIP, 6.2Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J622CS	SEM, ROHMK	1	R258
89	2007-001078	R-CHIP, 600ohm, 5%, 1/10W, DA, TP, 2012	RC2012J601CS	SEM, ROHMK	1	R175
90	2007-001100	R-CHIP, 62ohm, 5%, 1/10W, DA, TP, 2012	RC2012J620CS	SEM, ROHMK	1	R204
91	2007-001152	R-CHIP, 750ohm, 1%, 1/10W, DA, TP, 2012	RC2012F7500CS	SEM, ROHMK	2	R145, R254
92	2007-001201	R-CHIP, 820ohm, 5%, 1/10W, DA, TP, 2012	RC2012J821CS	SEM, ROHMK	1	R198
93	2007-001220	R-CHIP, 86.6Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F8662CS	SEM, ROHMK	2	R184, R187
94	2104-000111	VR-SMD, 10Kohm, 25%, 0.15W, TOP	RH03A3A14R-10KB	ALPS.MURATA	1	R9
95	2203-000009	C-CHIP, 820pF, 10%, 50V, X7R, TP, 2012	CL21B821KCACA	SEM, ROHM	8	C111, C113, C115, C116, C213, C216, C218, C221
96	2203-000009	C-CHIP, 820pF, 10%, 50V, X7R, TP, 2012	CL21B821KCACA	SEM, ROHM	5	C231, C233, C254, C256, C258
97	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	7	C1, C102~C105, C112, C128
98	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	16	C132~C136, C140~C148, C151, C153
99	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	13	C155, C158~C160, C162, C163, C165, C167~C172
100	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	18	C175~C183, C185~C190, C193 C194 C197
101	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	9	C199~C203, C205, C207, C214, C215
102	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	7	C219, C220, C222~C224, C229, C232
103	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	13	C234~C239, C244, C245, C252, C255, C257, C259, C267
104	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	7	C264, C268, C269, C270~C272, C283
105	2203-000239	C-CHIP, 100pF, 5%, 50V, NPO, TP, 2012	CL21C101JBNCA	SEM, MURATA, AVX	7	C117, C127, C196, C225~C228
106	2203-000239	C-CHIP, 100pF, 5%, 50V, NPO, TP, 2012	CL21C101JBNCA	SEM, MURATA, AVX	13	C240~C243, C248~C251, C260~C263, C279
107	2203-000260	C-CHIP, 10nF, 10%, 50V, X7R, TP, 2012	CL21B102KBNCA	SEM, MURATA, AVX	4	C195, C211, C280, C281
108	2203-000295	C-CHIP, 10PF, 5%, 50V, NPO, 2012	GRM40COG100J50	AVX, MURATA	2	C192, C204
109	2203-000316	C-CHIP, 120pF, 5%, 50V, NPO, 2012	CL21C121JBNC	SEM, MURATA, AVX	1	C154
110	2203-000429	C-CHIP, 18pF, 5%, 50V, NPO, 2012	CL21C180JBNC	SEM, MURATA	1	C273
111	2203-000455	C-CHIP, 1nF, 5%, 50V, NPO, TP, 2012	CL21C102JBNCA	SEM, MURATA	11	C108, C109, C119~C126, C130
112	2203-000455	C-CHIP, 1nF, 5%, 50V, NPO, TP, 2012	CL21C102JBNCA	SEM, MURATA	5	C156, C157, C166, C184, C191

NO	SEC CODE	DESCRIPTION	PART NUMBER	VENDER	Q`TY	REFERENCE
113	2203-000476	C-CHIP, 1uF, +80-20%, 16V, Y5V, TP, 2012	CL21F105ZONC	SEM, MURATA, AVX	2	C137, C138
114	2203-000595	C-CHIP, 220pF, 5%, 50V, NPO, TP, 2012	CL21C221JBNC	SEM, MURATA, AVX	4	C101, C118, C131, C286
115	2203-000634	C-CHIP, 22pF, 5%, 50V, NPO, 2012	CL21C220JBNC	SEM, MURATA, AVX	8	C106, C107, C110, C114, C208, C212, C217, C230
116	2203-000634	C-CHIP, 22pF, 5%, 50V, NPO, 2012	CL21C220JBNC	SEM, MURATA, AVX	5	C253, C274~C277
117	2203-000661	C-CHIP, 270pF, 5%, 50V, NPO, 2012	CL21C271JBNC	SEM, MURATA, AVX	1	C139
118	2203-000683	C-CHIP, 27pF, 5%, 50V, NPO, 2012	CL21C270JBNC	SEM, MURATA	2	C198, C210
119	2203-000818	C-CHIP, 33pF, 5%, 50V, NPO, 2012	08055A330JATMA	AVX, MURATA	2	C209, C287
120	2203-000858	C-CHIP, 39PF, 5%, 50V, NPO, 2012	CL21C390JBNC	SEM, MURATA	1	C278
121	2203-001139	C-CHIP, 68nF, +80-20%, 50V, Z5U, TP, 2012	CL21E683ZBNC	SEM, MURATA, AVX	2	C152, C288
122	2203-001158	C-CHIP, 68pF, 5%, 50V, NPO, 2012	CL21C680JBNC	SEM, MURATA, AVX	1	C174
123	2203-001517	C-CHIP, 15pF, 5%, 50V, NPO, TP, 2012	CL21C150JBNC	SEM, MURATA, AVX	2	C164, C173
124	2401-000172	C-AL, 1000uF, 20%, 35V, GP, TP, 12.5u20mm	1SD1VWB108M1320	SAMY, SAMHE	1	C15
125	2401-001143	C-AL, 330uF, 20%, 50V, GP, TP, 10u20, 5mm	CESSL1H331M1020A	SEM, SAMY	1	C10
126	2402-000110	C-AL, SMD, 10uF, 20%, 16V, GP, TP, 4u5.2, 1.4mm	ECEV1CA100SR	MATSU, SAMY	2	C9, C13
127	2402-000117	C-AL, SMD, 10uF, 20%, 35V, GP, 5*5.2mm, 1.4mm	ECEV1VA100SR	MATSU, SAMY	1	C7
128	2402-000135	C-AL, SMD, 22uF, 20%, 16V, -, 5.3u5.3u5.2	ECEV1CA220SR	MATSU, SAMY	3	C5, C8, C12
129	2402-000168	C-AL, SMD, 100uF, 20%, 16V, -, TP, 8u6.3	ECEV1CA101P	MATSU, SAMY, NICH	2	C4, C11
130	2402-000173	C-AL, SMD, 4.7uF, 20%, 35V, -, TP, 4u5.2	ECEV1VA4R7SR	MATSU, SAMY	1	C14
131	2402-000179	C-AL, SMD, 47uF, 20%, 16V, -, TP, 6.3u5.2	ECEV1CA470SP	MATSU, SAMY	2	C2, C3
132	2404-000151	C-TA, CHIP, 1uF, 20%, 16V, -, TP, 3216	TCSCN1C105MAAR	SEM, KEMET, AVX	1	C161
133	2409-001020	C-EDL, 1F, 5.5V.RADIL, 20.5u5	EECS5R5V105	PGCOM	1	C6
134	2703-000125	INDUCTOR-SMD, 10uH, 10%, 1.25u2u1.25mm	MLF2012E100K	TDK	1	L104
135	2801-003330	CRYSTAL-UNIT, 38.00053MHz, 15ppm, 28-AAM, 18pF	HC-49/U	SUNNY, ITC	1	Y1
136	2801-003582	CRYSTAL-UNIT, 30MHz, 50ppm, 28-AAM, 20pF, 40ohm	HC-49/S	ITC	1	Y2
137	3301-000325	CORE-FERRITE BEAD, AB, 3.2u2.5u1.3mm	HF50ACB322513-T	TDK	3	L101, L102, L105
138	3301-000325	CORE-FERRITE BEAD, AB, 3.2u2.5u1.3mm	HF50ACB322513-T	TDK	2	L109, L113
139	3301-000362	BEAD-CHIP, FERRITE CORE	HF50ACC322513	TDK	4	L108, L110~L112
140	3702-000001	CONNECTOR-RIBBON, 36P, STRAIGHT, AU, FEMALE, P-BRON	5T40360M-30NT	DDK	1	J2
141	3708-001187	CONNECTOR-FPC/FC/PIC, 23P, 1mm, STRAIGHT, SN	08-6232-023-007-800	ELCOK, FCI	2	JP1, JP2
142	3711-003976	CONNECTOR-HEADER, 1WALL, 4P, RED, 1R, 2.5mm, STRAIGHT	35300-0452	MOLEX	1	J10
143	3711-000225	CONNECTOR-HEADER, 1WALL, 4P, 1R, 2.5mm, STRAIGHT	5045-04A, ST	MOLEX	2	J4, J12
144	3711-000280	CONNECTOR-HEADER, 1WALL, 6P, 1R, 2.5mm, STRAIGHT	5045-06A, ST	MOLEX	1	J1
145	3711-002811	CONNECTOR-HEADER, BOX, 10P, 1R, 2mm, STRAIGHT	35303-1050	MOLEX	1	J5
146	3711-002813	CONNECTOR-HEADER, BOX, 12P, 1R, 2mm, STRAIGHT	35303-1250	MOLEX	1	J7
147	3711-003408	CONNECTOR-HEADER, BOX, 2P, 1R, 2mm, STRAIGHT	35303-0250	MOLEX	1	J8
148	3711-003409	CONNECTOR-HEADER, BOX, 3P, 1R, 2mm, STRAIGHT	35303-0350	MOLEX	1	J11
149	3711-003411	CONNECTOR-HEADER, BOX, 5P, 1R, 2mm, STRAIGHT	35303-0550	MOLEX	1	J3
150	4301-000108	BATTERY-LI, 3V, 210mAH, BUTTON, 20u3.2mm	CR2032	MATSU, EI	1	BT1
151	4701-001020	FREQ-ATTENUATOR, 5-80MHz, 15dB, -, 0.03W	FS741AZB	IMI	1	U104
152	JB13-10503A	IC ASIC-CPU, MJ-715S, KS32C6200, QFP, 160P	KS32C6200	SEC	1	U16
153	JG13-10062A	IC ASIC-IMAGE CHIP, SF4300, SCAN IP, QFP, 128P	STOA7110	SEC	1	U18
154	JG41-10118A	PCB-MAIN, SF4400, FR-4, 4L, T1.6mm, 215*87	PCB	KIJU	1	PCB

NO	SEC CODE	DESCRIPTION	PART NUMBER	VENDER	Q`TY	REFERENCE
1	0401-000116	DIODE-SWITCHING, MMSD914T1, 100V, 200mA, 225mW, 4nS	MMSD914T1	MOT	3	D103, D104, D106
2	0401-001003	DIODE-SWITCHING, MMBD6050LT1, 70V, 200mA, 225mW, 4n	MMBD6050LT1	MOT	2	D109, D110
3	0402-000199	DIODE-RECTIFIER, EGL41B, 100V, 1A, DO-213AB	EGL41B	GI	1	D111
4	0403-000287	DIODE-ZENER, MMBZ5251B, 22V, 5%, 225mW, SOT-23	MMBZ5251	MOT, MATSU	1	ZD101
5	0404-000112	DIODE-SCHOTTKY, RB420D, 25V, 100mA, SOT-23	RB420D T147	ROHM	3	D105, D107, D108
6	0407-001008	DIODE-ARRAY, DA204K, 20V, 100mA, C2-3, SOT-2	DA204K	ROHMK	2	D101, D102
7	0501-000279	TR-SMALL, KSA1182-Y, PNP, 150mW	KSA1182-Y	SEC	1	Q4
8	0501-000342	TR-SMALL SIGNAL, KSC1623-Y, NPN, 200mW, SOT-23	KSC1623-Y	SEC	2	Q5, Q101
9	0501-000415	TR-SMALL SIGNAL, KSP56, PNP, 625mW, TO-92	KSP56	SEC	1	Q6
10	0501-000457	TR-SMALL SIGNAL, MMBT2222A, NPN, 225mW, SOT-23	KST2222A-TF	SEC, MOT	6	Q2, Q102, Q103, Q105, Q106, Q107
11	0501-000457	TR-SMALL SIGNAL, MMBT2222A, NPN, 225mW, SOT-23	KST2222A-TF	SEC, MOT	2	Q1, Q3 COLOR ONLY
12	0501-000462	TR-SMALL SIGNAL, MMBT2907A, PNP, 225mW, SOT-23	KST2907A	SEC, MOT, PHI	1	Q104
13	0503-000129	TR-DARLINGTON, TIP112, NPN, 2W, TO-220AB	TIP112	SEC	1	Q7
14	0604-001033	PHOTO-INTERRUPTER	GP1S523	SHARP	1	S1
15	0801-000379	IC-CMOS LOGIC, 74HC00, NAND GATE, SOP, 14P, 150MIL	GD74HC00D/RT	LGS, PHI, TI	1	U101
16	0801-000387	IC-CMOS LOGIC, 74HC08, AND GATE, SOP, 14P, 150MIL	MC74HC08AD	MOT, HARRI	1	U3
17	0801-000794	IC-CMOS LOGIC, 7S08, AND GATE, SOP, 5P, 64MIL	TC7S08FUTE85L	TSB	1	U105
18	0803-000916	IC-TTL, 74LS245, TRANSCEIVER, SOP, 20P, 300MIL	SN74LS245DW	MOT.NSC	1	U4
19	0909-000101	IC-REAL TIME CLOCK, 4513, SOP, 14P, 300MIL, 0.032MHz	RTC-4513	EPSON	1	U102
20	1001-000170	IC-ANALOG SWITCH, MC14051BD, SPDT CMOS, SOP, 16P	MC14051BD	MOT	1	U11
21	1001-000171	IC-ANALOG SWITCH, MC14053BD, SPDT CMOS, SOP, 16P, 150MIL	MC14053BD	MOT	1	U9
22	1003-000243	IC-MOTOR DRIVER, PBL3717A, DIP, 16P, 300MIL	PBL3717A	SGS	4	U1, U2, U23, U24
23	1003-001102	IC-MOTOR DRIVER, TEA3718DP, DIP, 16P, 300MIL	TEA3718DP	SGS	2	U25, U28
24	1003-001137	IC-SOURCE DRIVER, HD8, CD1603, SOP, 24P	CD1603(R)	PHI	2	U32, U33
25	1003-001138	IC-SOURCE DRIVER, HD7, CD1602, SOP, 20P	CD1602(R)	PHI	2	U26, U27
26	1105-001030	IC-DRAM, 416C1200, 1Mx16BIT, SOJ, 42P, 400MIL	KM416C1200BLJ-6	SEC	2	U6, U8(option)
27	1106-000197	IC-SRAM, 62256B, 32K*8BIT, SOP, 28P, 450MIL	KM62256BLG-10	SEC	1	U14
28	1106-001012	IC-SRAM, 68257, 32KX8BIT, SOJ, 28P, 300MIL	KM68257CJ-15	SEC	1	U21
29	1107-001081	IC-FLASH MEMORY, 29F400, 256Kx16BIT, SOP, 48P, 600MIL	AM29F400BB-70EC	AMD	1	U5
30	1201-000105	IC-AUDIO AMP, 34119, SOP, 8P, 150MIL, SINGLE	MC34119DR2	MOT	1	U10
31	1201-000167	IC-OP AMP, 358, SOP, 8P, 150MIL, DUAL, 100V/mV	KA358D-T/F	SEC	4	U12, U13, U17, U20
32	1201-001052	IC-OP AMP, 14577, SOP, 8P, 150, DUAL, -, PLASTI	MC14577CFR2	MOT	1	U19
33	1202-000170	IC-VOLTAGE COMP, 339, SOP, 14P, 150MIL, QUAD, 36V	KA339D	SEC, PHI	1	U22
34	1203-000623	IC-VOL. DETECTOR, 7045, SOT-89, 3P, -, PLASTIC	KIA7045F	KEC	1	U103
35	1205-001134	IC-MODEM, KS16117Q, QFP, 100P, -, PLASTIC, 5V	KS16117Q	SEC	1	U15
36	2001-000202	R-CARBON, 0.5ohm, 5%, 1/2W, AA, TP, 3.3u9mm	CR1/2W, 0.5, J	ABCO	6	R1, R2, R12~R15
37	2007-000023	R-CHIP, 120ohm, 5%, 1/10W, DA, TP, 2012	RC2012J121CS	SEM, ROHMK	1	R102
38	2007-000026	R-CHIP, 200ohm, 5%, 1/10W, DA, TP, 2012	RC2012J201CS	SEM, ROHMK	3	R110, R112, R147
39	2007-000028	R-CHIP, 39ohm, 5%, 1/10W, DA, TP, 2012	RC2012J390CS	SEM, ROHMK	8	R106, R108, R109, R113, R114, R117, R118, R121
40	2007-000028	R-CHIP, 39ohm, 5%, 1/10W, DA, TP, 2012	RC2012J390CS	SEM, ROHMK	6	R123, R125, R126, R129, R143, R307
41	2007-000029	R-CHIP, 0ohm, 5%, 1/10W, DA, TP, 2012	RC2012J000CS	SEM, ROHMK	4	R165, R181, R223, R322
42	2007-000223	R-CHIP, 1.2Kohm, 5%, 1/8W, DA, TP, 3216	RC3216J122CS	SEM, ROHMK	1	R278
43	2007-000238	R-CHIP, 1.5Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F1501CS	SEM, ROHMK	4	R156, R196, R251, R296
44	2007-000238	R-CHIP, 1.5Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F1501CS	SEM, ROHMK	2	R155, R157
45	2007-000245	R-CHIP, 1.5Kohm, 5%, 1/8W, DA, TP, 3216	RC3216J152CS	SEM, ROHMK	1	R312
46	2007-000282	R-CHIP, 100Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J104CS	SEM, ROHMK	5	R170, R176, R178, R224, R249
47	2007-000285	R-CHIP, 100Kohm, 5%, 1/8W, DA, TP, 3216	RC3216J104CS	SEM, ROHMK	2	R272, R283
48	2007-000290	R-CHIP, 100ohm, 5%, 1/10W, DA, TP, 2012	RC2012J101CS	SEM, ROHMK	10	R215, R217, R218, R220, R252, R256, R279, R280~R282

49	2007-000290	R-CHIP, 100ohm, 5%, 1/10W, DA, TP, 2012	RC2012J101CS	SEM, ROHMK	7	R288, R292~R295, R298, R299
50	2007-000290	R-CHIP, 100ohm, 5%, 1/10W, DA, TP, 2012	RC2012J101CS	SEM, ROHMK	7	R300, R301, R308, R309, R310, R311, R313
51	2007-000297	R-CHIP, 10Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F1002CS	SEM, ROHMK	5	R103, R245, R253, R297, R306
52	2007-000300	R-CHIP, 10Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J103CS	SEM, ROHMK	8	R152, R167, R183, R188, R195, R201~R203
53	2007-000300	R-CHIP, 10Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J103CS	SEM, ROHMK	10	R205~R207, R225, R247, R315~R318, R319
54	2007-000325	R-CHIP, 118Kohm, 1%, 1/10W, DA, TP, 2012	RC2012J1183CS	SEM	1	R177
55	2007-000395	R-CHIP, 150Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J154CS	SEM, ROHMK	2	R166, R174
56	2007-000406	R-CHIP, 15Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F1502CS	SEM, ROHMK	1	R243
57	2007-000409	R-CHIP, 15Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J153CS	SEM, ROHMK, NIC	1	R287
58	2007-000444	R-CHIP, 180Kohm, 5%, 1/10W, DA, TP, 2012	MCR10EZHJ184	ROHMK, MATSU	2	R171, R189
59	2007-000449	R-CHIP, 180ohm, 5%, 1/10W, DA, TP, 2012	RC2012J181CS	SEM, ROHMK	2	R208, R209
60	2007-000465	R-CHIP, 1Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F1001CS	SEM, ROHMK	5	R226, R228, R242, R244, R286
61	2007-000465	R-CHIP, 1Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F1001CS	SEM, ROHMK	1	R240
62	2007-000468	R-CHIP, 1Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J102CS	SEM, ROHMK	8	R101, R115, R116, R119, R120, R122, R124, R127
63	2007-000468	R-CHIP, 1Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J102CS	SEM, ROHMK	7	R128, R131, R133, R137, R150, R158, R163
64	2007-000468	R-CHIP, 1Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J102CS	SEM, ROHMK	4	R234, R260, R262, R263
65	2007-000468	R-CHIP, 1Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J102CS	SEM, ROHMK	5	R267, R269, R271, R285, R303
66	2007-000477	R-CHIP, 1Mohm, 5%, 1/10W, DA, TP, 2012	RC2012J105CS	SEM, ROHMK	2	R148, R182
67	2007-000508	R-CHIP, 2.4Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F2401CS	SEM, ROHMK, KAMAY	1	R229
68	2007-000542	R-CHIP, 200ohm, 5%, 1/8W, DA, TP, 3216	RC3216J201CS	SEM, ROHMK	3	R241, R275, R277
69	2007-000551	R-CHIP, 20ohm, 5%, 1/10W, DA, TP, 2012	RC2012J200CS	SEM, ROHMK	1	R199
70	2007-000565	R-CHIP, 220Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J224CS	SEM, ROHMK	2	R186, R197
71	2007-000586	R-CHIP, 22Kohm, 5%, 1/10W	RC2012J223CS	SEM, ROHMK	1	R168
72	2007-000671	R-CHIP, 2Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J202CS	SEM, ROHMK	3	R135, R211, R255
73	2007-000703	R-CHIP, 3.6Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J362CS	SEM, ROHMK	2	R136, R268
74	2007-000705	R-CHIP, 3.6Kohm, 5%, 1/8W, DA, TP, 3216	RC3216J362CS	SEM, ROHMK	1	R291
75	2007-000728	R-CHIP, 300ohm, 5%, 1/10W, DA, TP, 2012	RC2012J301CS	SEM, ROHMK	1	R190
76	2007-000738	R-CHIP, 30Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J303CS	SEM, ROHMK	2	R149, R192
77	2007-000757	R-CHIP, 330Kohm, 5%, 1/10W	RC2012J334CS	SEM, ROHMK	4	R179, R186, R323, R324
78	2007-000766	R-CHIP, 330ohm, 5%, 1/10W, DA, TP, 2012	RC2012J331CS	SEM, ROHMK	2	R265 R276
79	2007-000791	R-CHIP, 36.5Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F3652CS	SEM, ROHMK	1	R194
80	2007-000814	R-CHIP, 39.2Kohm, 1%, 1/8W, DA, TP, 3216	RC3216F3922CS	SEM, ROHMK	1	R238
81	2007-000844	R-CHIP, 3Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J302CS	SEM, ROHMK	4	R139, R172, R193, R270
82	2007-000844	R-CHIP, 3Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J302CS	SEM, ROHMK	2	R141, R154
83	2007-000872	R-CHIP, 4.7Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J472CS	SEM, ROHMK	4	R153, R169, R200, R305
84	2007-000920	R-CHIP, 47.5Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F4752CS	SEM, ROHMK	1	R191
85	2007-000941	R-CHIP, 47Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J473CS	SEM, ROHMK	7	R138, R151, R180, R235, R250, R266, R274
86	2007-000964	R-CHIP, 5.1Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J512CS	SEM, ROHMK	8	R105, R107, R111, R134, R144, R146, R231, R232
87	2007-000964	R-CHIP, 5.1Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J512CS	SEM, ROHMK	3	R248, R259, R264
88	2007-000981	R-CHIP, 5.6Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J562CS	SEM, ROHMK	2	R210, R227
89	2007-000998	R-CHIP, 510ohm, 1%, 1/10W, DA, TP, 2012	RC2012F5100CS	SEM, ROHMK	3	R104, R257, R304
90	2007-001013	R-CHIP, 51ohm, 5%, 1/10W, DA, TP, 2012	RC2012J510CS	SEM, ROHMK	1	R320 MONO ONLY
91	2007-001013	R-CHIP, 51ohm, 5%, 1/10W, DA, TP, 2012	RC2012J510CS	SEM, ROHMK	1	R230 COLOR ONLY
92	2007-001039	R-CHIP, 56Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J563CS	SEM, ROHMK	7	R130, R132, R246, R261, R273, R284, R302
93	2007-001055	R-CHIP, 6.2Kohm, 5%, 1/10W, DA, TP, 2012	RC2012J622CS	SEM, ROHMK	1	R258
94	2007-001078	R-CHIP, 600ohm, 5%, 1/10W, DA, TP, 2012	RC2012J601CS	SEM, ROHMK	1	R175
95	2007-001100	R-CHIP, 62ohm, 5%, 1/10W, DA, TP, 2012	RC2012J620CS	SEM, ROHMK	1	R204
96	2007-001152	R-CHIP, 750ohm, 1%, 1/10W, DA, TP, 2012	RC2012F7500CS	SEM, ROHMK	2	R145, R254

97	2007-001201	R-CHIP, 820ohm, 5%, 1/10W, DA, TP, 2012	RC2012J821CS	SEM, ROHMK	1	R198
98	2007-001220	R-CHIP, 86.6Kohm, 1%, 1/10W, DA, TP, 2012	RC2012F8662CS	SEM, ROHMK	2	R184, R187
99	2104-000111	VR-SMD, 10Kohm, 25%, 0.15W, TOP	RH03A3A14R-10KB	ALPS.MURATA	1	R9
100	2203-000009	C-CHIP, 820pF, 10%, 50V, X7R, TP, 2012	CL21B821KCACA	SEM, ROHM	8	C111, C113, C115, C116, C213, C216, C218, C221
101	2203-000009	C-CHIP, 820pF, 10%, 50V, X7R, TP, 2012	CL21B821KCACA	SEM, ROHM	5	C231, C233, C254, C256, C258
102	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	7	C1, C102~C105, C112, C128
103	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	16	C132~C136, C140~C148, C151, C153
104	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	13	C155, C158~C160, C162, C163, C165, C167~C172
105	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	18	C175~C183, C185~C190, C193 C194 C197
106	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	9	C199~C203, C205, C207, C214, C215
107	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	7	C219, C220, C222~C224, C229, C232
108	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	13	C234~C239, C244, C245, C252, C255, C257, C259, C267
109	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	2	C265, C266
110	2203-000199	C-CHIP, 100nF, +80-20%, 50V, Z5U, TP, 2012	GRM40Z5U104Z50PT	MURATA, AVX, TDKK	7	C264, C268, C269, C270~C272, C283
111	2203-000239	C-CHIP, 100pF, 5%, 50V, NPO, TP, 2012	CL21C101JBNCA	SEM, MURATA, AVX	7	C117, C127, C196, C225~C228
112	2203-000239	C-CHIP, 100pF, 5%, 50V, NPO, TP, 2012	CL21C101JBNCA	SEM, MURATA, AVX	13	C240~C243, C248~C251, C260~C263, C279
113	2203-000260	C-CHIP, 10nF, 10%, 50V, X7R, TP, 2012	CL21B102KBNCA	SEM, MURATA, AVX	4	C195, C211, C280, C281
114	2203-000295	C-CHIP, 10PF, 5%, 50V, NPO, 2012	GRM40COG100J50PT	AVX, MURATA	2	C192, C204
115	2203-000316	C-CHIP, 120pF, 5%, 50V, NPO, 2012	CL21C121JBNC	SEM, MURATA, AVX	1	C154
116	2203-000429	C-CHIP, 18pF, 5%, 50V, NPO, 2012	CL21C180JBNC	SEM, MURATA	1	C273
117	2203-000455	C-CHIP, 1nF, 5%, 50V, NPO, TP, 2012	CL21C102JBNCA	SEM, MURATA	11	C108, C109, C119~C126, C130
118	2203-000455	C-CHIP, 1nF, 5%, 50V, NPO, TP, 2012	CL21C102JBNCA	SEM, MURATA	5	C156, C157, C166, C184, C191
119	2203-000476	C-CHIP, 1uF, +80-20%, 16V, Y5V, TP, 2012	CL21F105ZONC	SEM, MURATA, AVX	2	C137, C138
120	2203-000595	C-CHIP, 220pF, 5%, 50V, NPO, TP, 2012	CL21C221JBNC	SEM, MURATA, AVX	4	C101, C118, C131, C286
121	2203-000634	C-CHIP, 22pF, 5%, 50V, NPO, 2012	CL21C220JBNC	SEM, MURATA, AVX	8	C106, C107, C110, C114, C208, C212, C217, C230
122	2203-000634	C-CHIP, 22pF, 5%, 50V, NPO, 2012	CL21C220JBNC	SEM, MURATA, AVX	5	C253, C274~C277
123	2203-000661	C-CHIP, 270pF, 5%, 50V, NPO, 2012	CL21C271JBNC	SEM, MURATA, AVX	1	C139
124	2203-000683	C-CHIP, 27pF, 5%, 50V, NPO, 2012	CL21C270JBNC	SEM, MURATA	2	C198, C210
125	2203-000818	C-CHIP, 33pF, 5%, 50V, NPO, 2012	08055A330JATMA	AVX, MURATA	2	C209, C287
126	2203-000858	C-CHIP, 39PF, 5%, 50V, NPO, 2012	CL21C390JBNC	SEM, MURATA	1	C278
127	2203-001139	C-CHIP, 68nF, +80-20%, 50V, Z5U, TP, 2012	CL21E683ZBNC	SEM, MURATA, AVX	2	C152, C288
128	2203-001158	C-CHIP, 68pF, 5%, 50V, NPO, 2012	CL21C680JBNC	SEM, MURATA, AVX	1	C174
129	2203-001517	C-CHIP, 15pF, 5%, 50V, NPO, TP, 2012	CL21C150JBNC	SEM, MURATA, AVX	2	C164, C173
130	2401-000172	C-AL, 1000uF, 20%, 35V, GP, TP, 12.5u20mm	1SD1VWB108M1320	SAMY, SAMHE	1	C15
131	2401-001143	C-AL, 330uF, 20%, 50V, GP, TP, 10u20, 5mm	CESSL1H331M1020A	SEM, SAMY	1	C10
132	2402-000110	C-AL, SMD, 10uF, 20%, 16V, GP, TP, 4u5.2, 1.4mm	ECEV1CA100SR	MATSU, SAMY	2	C9, C13
133	2402-000117	C-AL, SMD, 10uF, 20%, 35V, GP, 5*5.2mm, 1.4mm	ECEV1VA100SR	MATSU, SAMY	1	C7
134	2402-000135	C-AL, SMD, 22uF, 20%, 16V, -, 5.3u5.3u5.2	ECEV1CA220SR	MATSU, SAMY	3	C5, C8, C12
135	2402-000168	C-AL, SMD, 100uF, 20%, 16V, -, TP, 8u6.3	ECEV1CA101P	MATSU, SAMY, NICH	2	C4, C11
136	2402-000173	C-AL, SMD, 4.7uF, 20%, 35V, -, TP, 4u5.2	ECEV1VA4R7SR	MATSU, SAMY	1	C14
137	2402-000179	C-AL, SMD, 47uF, 20%, 16V, -, TP, 6.3u5.2	ECEV1CA470SP	MATSU, SAMY	2	C2, C3
138	2404-000151	C-TA, CHIP, 1uF, 20%, 16V, -, TP, 3216	TCSCN1C105MAAR	SEM, KEMET, AVX	1	C161
139	2409-001020	C-EDL, 1F, 5.5V.RADIL, 20.5u5	EECS5R5V105	PGCOM	1	C6
140	2703-000125	INDUCTOR-SMD, 10uH, 10%, 1.25u2u1.25mm	MLF2012E100K	TDK	1	L104
141	2801-003330	CRYSTAL-UNIT, 38.00053MHz, 15ppm, 28-AAM, 18pF	HC-49/U, 38.00053MHz	SUNNY, ITC	1	Y1
142	2801-003582	CRYSTAL-UNIT, 30MHz, 50ppm, 28-AAM, 20pF, 40ohm	HC-49/S(30MHz, 50ppm)	ITC	1	Y2
143	3301-000325	CORE-FERRITE BEAD, AB, 3.2u2.5u1.3mm	HF50ACB322513-T	TDK	3	L101, L102, L105

144	3301-000325	CORE-FERRITE BEAD, AB, 3.2u2.5u1.3mm	HF50ACB322513-T	TDK	2	L109, L113
145	3301-000362	BEAD-CHIP, FERRITE CORE	HF50ACC322513	TDK	4	L108, L110~L112
146	3702-000001	CONNECTOR-RIBBON, 36P, STRAIGHT, AU, FEMALE, P-BRON	5T40360M-30NT	DDK	1	J2
147	3708-001187	CONNECTOR-FPC/FC/PIC, 23P, 1mm, STRAIGHT, SN	08-6232-023-007-800	ELCOK, FCI	2	JP1, JP2
148	3711-003977	CONNECTOR-HEADER, BOX, 12P, RED, 1R, 2mm, STRAIGHT	35303-1252	MOLEX	1	J6
149	3711-003976	CONNECTOR-HEADER, 1WALL, 4P, RED, 1R, 2.5mm, STRAIGHT	35300-0452	MOLEX	1	J10
150	3711-000225	CONNECTOR-HEADER, 1WALL, 4P, 1R, 2.5mm, STRAIGHT	5045-04A, ST	MOLEX	2	J4, J12
151	3711-000280	CONNECTOR-HEADER, 1WALL, 6P, 1R, 2.5mm, STRAIGHT	5045-06A, ST	MOLEX	1	J1
152	3711-002811	CONNECTOR-HEADER, BOX, 10P, 1R, 2mm, STRAIGHT	35303-1050	MOLEX	1	J5
153	3711-002813	CONNECTOR-HEADER, BOX, 12P, 1R, 2mm, STRAIGHT	35303-1250	MOLEX	1	J7
154	3711-003408	CONNECTOR-HEADER, BOX, 2P, 1R, 2mm, STRAIGHT	35303-0250	MOLEX	1	J8
155	3711-003409	CONNECTOR-HEADER, BOX, 3P, 1R, 2mm, STRAIGHT	35303-0350	MOLEX	1	J11
156	3711-003411	CONNECTOR-HEADER, BOX, 5P, 1R, 2mm, STRAIGHT	35303-0550	MOLEX	1	J3
157	4301-000108	BATTERY-LI, 3V, 210mAH, BUTTON, 20u3.2mm	CR2032	MATSU, EI	1	BT1
158	4701-001020	FREQ-ATTENUATOR, 5-80MHz, 15dB, -, 0.03W	FS741AZB	IMI	1	U104
159	JB13-10503A	IC ASIC-CPU, MJ-715S, KS32C6200, QFP, 160P	KS32C6200	SEC	1	U16
160	JG13-10062A	IC ASIC-IMAGE CHIP, SF4300, SCAN IP, QFP, 128P	STOA7110	SEC	1	U18
161	JG41-10118A	PCB-MAIN, SF4400, FR-4, 4L, T1.6mm, 215*87	PCB	KIJU	1	PCB

1	0401-000140	DIODE-SWITCHING, 1N4148, 100V, 200mA, 500mW, 4nS, DO		1N4148T/R	DSMS, NSC, TERR	2	D1, D8
2	0402-000339	DIODE-BRIDGE, W06F, 600V, 1.5A	W06G	GI	1	BD1	
3	0403-000139	DIODE-ZENER, 1N4734A, 5.6V, 5%, 1W, DO-41, TP	1N4734AT/R	ITT, MOT	1	ZD8	
4	0403-000155	DIODE-ZENER, 1N4748A, 22V, 5%, 1W, DO-41, TP	1N4748A	ITT, MOT	1	ZD5	
5	0403-000294	DIODE-ZENER, MTZ4.7B, 4.7V, 4.55-4.80V, 500	MTZ4.7B	ROHMK	2	ZD1, ZD2	
6	0403-000532	DIODE-ZENER, 1N4740A, 10V, 5%, 1W, DO-41, TP	1N4740A	ITT, MOT	1	ZD7	
7	0403-000537	DIODE-ZENER, 1N4749A, 24V, 5%, 1W, DO-41, TP	1N4749A	ITT, MOT	1	ZD9	
8	0407-000122	DIODE-ARRAY, KDS226, 80V, 300mA, C2-3, SOT-23	KDS226	KEC, TSB	4	D2~D5	
9	0501-000242	TR-SMALL SIGNAL, BC547B, NPN, 500mW, TO-92, TP, 200	BC547B	ITT, NSC	1	Q5	
10	0501-000500	TR-SMALL SIGNAL, KSP45, NPN, 625mW, TO-92, TP, 50-20		MPSA45	SEC, MOT	1	Q1
11	0501-000550	TR-SMALL SIGNAL, BC327-16, PNP, 625mW, TO-92, TP	BC327-16	SEC, ITT	2	Q6-7	
12	0502-000133	TR-POWER, 2SA1156, PNP, 1W, TO-126, -, 40-80	2SA1156-R	SEC, NEC	1	Q2	
13	0505-000123	FET-SILICON, BS170, N, 60V, 500mA, 5ohm, 350mW	BS170-RLRA	ITT, MOT	1	Q4	
14	0604-000118	PHOTO-COUPLER, TR, 20-300%, 200mW, DIP-4, ST	PC814	SHARP, KOC, TSB	1	U2	
15	0604-000119	PHOTO-COUPLER, PC817C, 200-400%	PC817C	SHARP, KOC, TSB	1	U6	
16	0604-000237	PHOTO-COUPLER, PC817, NO-MARKING	PC817	SHARP, KOC, TSB	2	U4-5	
17	1405-000170	VARISROR, 82V, DISC, 9MM	V82ZA2	HARRIS, MATSU	1	VAR1	
18	1405-000226	VARISTOR, 25A, 5mm, TP	VR61BTP	ORIGI	2	VAR2, VAR3	
19	4715-000127	SURGE ABSORBER, MEP, ARRESTER, 2P, 5u11, 300V	DSS-301L-A22R	MITSU	4	ARS1, ARS2, ARS3, ARS4	
20	2001-000065	REF-CARBON, 10Kohm, 5%, 1/4W	CR1/4W, 10K, J	ABCO	1	R6	
21	2001-000294	REF-CARBON, 10M, 5%, 1/4W	CR1/4W, 10M, J	ABCO	1	R7	
22	2001-000626	REF-CARBON, 300, 300ohm, 5%, 1/4W	MR1/4W, 300, F	ABCO	1	R49	
23	2001-000637	REF-CARBON, 30, 2%, 1/2W	CR1/2W, 30, G	ABCO	1	R48	
24	2001-000643	REF-CARBON, 330K, 5%, 1/4W	CR1/4W, 330K, J	ABCO	1	R9	
25	2001-001004	REF-CARBON, 82ohm, 5%, 1/4W	CR1/4W, 82, J	ABCO	1	R4	
26	2007-000002	REF-CHIP, 75Kohm, 5%, 1/10W, 2012	RC2012J753CS	SEM, ROHMK	1	R1	
27	2007-000029	REF-CHIP, 0, 5%, 1/10W, 2012	RC2012J000BS	SEM, ROHMK	3	R26, R27, R42	
28	2007-000033	REF-CHIP.0, 5%, 1/8W, 3216	RC3216J000BS	SEM, ROHMK	2	R36, R50	
29	2007-000033	REF-CHIP.0, 5%, 1/8W, 3216	RC3216J000BS	SEM, ROHMK	30	J2~J4, J6~J8, J10~J33	
30	2007-000282	REF-CHIP, 100K, 5%, 1/10W, 150V	RC2012J104BS	SEM, ROHMK	3	R3, R33, R101	
31	2007-000300	REF-CHIP, 10K, 5%, 1/10W, 150V	RC2012J103BS	SEM, ROHMK	1	R38	
32	2007-000409	REF-CHIP, 15Kohm, 5%, 1/10W, 150V	RC2012J153CS	SEM, ROHMK	2	R30, R40	
33	2007-000465	REF-CHIP, 1Kohm, 1%, 1/10W, 150V	RC2012F1001CS	SEM, ROHMK	1	R11	
34	2007-000468	REF-CHIP, 1K, 5%, 1/10W, 150V	RC2012J102BS	SEM, ROHMK	2	R13, R17	
35	2007-000498	REF-CHIP, 2.2M, 5%, 1/10W, 150V	RC2012J225BS	SEM, ROHMK	2	R22, R24	
36	2007-000572	REF-CHIP, 220ohm, 5%, 1/10W, 2012	RC2012J221CS	SEM, ROHMK	1	R45	
37	2007-000671	REF-CHIP, 2Kohm, 5%, 1/10W, 2012	RC2012J202CS	SEM, ROHMK	1	R51	
38	2007-000686	REF-CHIP, 3.3Kohm, 5%, 1/10W, 2012	RC2012J332CS	SEM, ROHMK	1	R18	
39	2007-000757	REF-CHIP, 330K, 5%, 1/10W, 150V	RC2012J334BS	SEM, ROHMK	3	R10, 21, R23	
40	2007-000774	REF-CHIP, 33K, 5%, 1/10W, 150V	RC2012J333CS	SEM, ROHMK	1	R41	
41	2007-000822	REF-CHIP, 390ohm, 5%, 1/10W, 2012	RC2012J391CS	SEM, ROHMK	1	R46	
42	2007-000859	REF-CHIP, 4.3K, 5%, 1/10W, 151V	RC2012J432CS	SEM, ROHMK	1	R12	
43	2007-000931	REF-CHIP, 470, 5%, 1/10W	RC2012J471CS	SEM, ROHMK	1	R44	
44	2007-000964	REF-CHIP, 5.1K, 5%, 1/10W, 150V	RC3216J512CS	SEM, ROHMK	1	R32	
45	2007-001001	REF-CHIP, 510, 5%, 1/10W	RC2012J511BS	SEM, ROHMK	1	R39	
46	2007-001071	REF-CHIP, 6.8K, 5%, 1/10W, 150V	RC2012J682CS	SEM, ROHMK	1	R2	
47	2007-001177	REF-CHIP, 8.2K, 5%, 1/10W, 150V	RC2012J822CS	SEM, ROHMK	1	R47	
48	2203-000192	CAP-CERAMIC, 100NF, 50V, 5%	CL21F104ZBNC	SEM, MURATA	1	C37	
49	2203-000260	CAP-CERAMIC, 10NF, 50V, 5%, 2012	CL21B103KBNC	SEM, MURATA	4	C11, C47~C49	
50	2203-000374	CAP-CERAMIC, 15NF, 50V, 5%, 2012	CL21B153KBNC	SEM, MURATA	2	C6, C40	
51	2203-000376	CAP-CERAMIC, 15NF, 50V, 5%, 3216	CL31B153KBNC	SEM, MURATA	1	C30	
52	2203-000429	CAP-CERAMIC, 18PF, 5%, 50V, 2012	CL21C180JBNC	SEM, MURATA	1	C27	

53	2203-000455	CAP-CERAMIC, 1NF, 50V, 5%, 5M, NPO	CL21C102JBNC	SEM, MURATA	3	C1, C12, C22
54	2203-000595	CAP-CERAMIC, 220PF, 50V, 5%, 2012	CL31C221JBNC	SEM, MURATA	7	C13~C17, 20, 21
55	2203-000609	CAP-CERAMIC, 22NF, 50V, 5%, 2012	CL21B223KBNC	SEM, MURATA	1	C46
56	2203-000979	CAP-CERAMIC, 47NF, 50V, 5%, 2012	GRM40X7R473K50PT	MURATA, AVX, KY	2	C19, C23
57	2203-001142	CAP-CERAMIC, 68NF, 50V, 5%, 2012	CL21B683KANC	SEM, MURATA	2	C4, C18
58	2305-000218	CAP-FILM, MPEF, 1UF, 250V, 10%	MMT.2E, 105K	SHIN	1	C3
59	2305-000378	CAP-FILM, MPEF, 4.7nF, 10%, 400V	MMY7.5-472K400V	YUCHA	1	C8
60	2401-000042	CAP-AL.ELEC, 100UF, 16V, 20%	1SS1CAB107M	SEM, SAMH	2	C24, C39
61	2401-000217	CAP-AL.ELEC, 100NF, 50V, 20%	1SS1HAB104MAN04007	SEM, SAMH	1	C45
62	2401-000486	CAP-AL.ELEC, 10UF, 50V	CESSM1H100MAAT	SEM, SAMY, SAMH	3	C25, C28, C38
63	2401-000597	CAP-AL.ELEC, 1UF, 50V	CESSM1H010MAAB	SEM, SAMY, SAMH	2	C34, C42
64	2401-000911	CAP-AL.ELEC, 22UF, 16V	CESSM1C220M0507BB	SEM, SAMY, SAMH	1	C44
65	2401-001368	CAP-AL.ELEC, 470UF, 16V	CESSL1C471MAAT	SEM, SAMY, SAMH	1	C32
66	2401-001775	CAP-AL, ELEC, 0.47UF/50V	CESSM1HR47MAAB	SEM, SAMY, SAMH	2	C31, C43
67	2403-000124	CAP-TA, DIPPED, 10uF, 20%, 16V(50v)	TBG1C-100MSS	DAEWO, SPRAG	1	C362403-000123(AM)
68	2404-000151	CAP-TA.ELEC, 1UF, 20%	T491A105M016AS	SEM, AVX, KEMET	1	C10
69	2802-001029	C-RESO, 3.58M, 0.5%:CSA3.58MHz	CSA3.58MG312AM	MURATA	1	X1
70	3501-001025	RELAY-MINIATURE, 12V:2FORM	G6A-234P-BS	OMRON	1	CML1
71	3711-002807	CONN-HEADER, 6P, 2MM, STRAIGHT	35303-0650	MOLEX	1	P3
72	3711-002808	CONN-HEADER, 7P, 2MM, STRAIGHT	35303-0750	MOLEX	1	P4
73	3711-002812	CONN-HEADER, 11P, 2MM, STRAIGHT	35303-1150	MOLEX	1	P2
74	3711-002813	CONN-HEADER, 12P, 2mm, STRAIGHT	35303-1250	MOLEX	1	P1
75	BH39-40305U	WIRE-NO SHEATH, JUMPER WIRE, AWG22(0.6PI)	JUMPER-WIRE	KJEW, LGC	13	JP2, JP3, JP5~JP11, JP13~JP16
76	JB41-10508A	MJ-715S, FR-4, 1L, T1.6mm, 110u90, LIU PCB	LIU PCB	CJE	1	PCB
77	JF13-10073A	I-LIU Chip, STI9510, DIP, 40P	STI9510	AMS	1	U3
78	JF27-30051A	COIL-RF, SF1000, 5.6UH, 1.9OHM	BAL03NA5R6K	BOAM, TAIYO	4	L4~L7
79	JF27-60051A	COIL-FILTER, IND-RF, 60UH	SBT-0260T	TOKIN	2	FLT1-2
80	JG26-50001A	600:600 Transformer, 100-1016	100-1016	SUNGMOON	2	T2, T3

1	0401-000140	DIODE-SWITCHING, 1N4148, 100V, 200mA, 500mW, 4nS, DO		1N4148T/R	DSMS, NSC, TERR	2	D1, D8	
2	0402-000339	DIODE-BRIDGE, W06F, 600V, 1.5A	W06G	GI	1	BD1		
3	0403-000139	DIODE-ZENER, 1N4734A, 5.6V, 5%, 1W, DO-41, TP	1N4734AT/R	ITT, MOT	1	ZD8		
4	0403-000155	DIODE-ZENER, 1N4748A, 22V, 5%, 1W, DO-41, TP	1N4748A	ITT, MOT	1	ZD5		
5	0403-000294	DIODE-ZENER, MTZ4.7B, 4.7V, 4.55-4.80V, 500	MTZ4.7B	ROHMK	2	ZD1, ZD2		
6	0403-000532	DIODE-ZENER, 1N4740A, 10V, 5%, 1W, DO-41, TP	1N4740A	ITT, MOT	1	ZD7		
7	0403-000537	DIODE-ZENER, 1N4749A, 24V, 5%, 1W, DO-41, TP	1N4749A	ITT, MOT	1	ZD9		
8	0407-000122	DIODE-ARRAY, KDS226, 80V, 300mA, C2-3, SOT-23	KDS226	KEC, TSB	4	D2~D5		
9	0501-000242	TR-SMALL SIGNAL, BC547B, NPN, 500mW, TO-92, TP, 200	BC547B	ITT, NSC	1	Q5		
10	0501-000500	TR-SMALL SIGNAL, KSP45, NPN, 625mW, TO-92, TP, 50-20		MPSA45	SEC, MOT	1	Q1	
11	0501-000550	TR-SMALL SIGNAL, BC327-16, PNP, 625mW, TO-92, TP	BC327-16	SEC, ITT	2	Q6-7		
12	0502-000133	TR-POWER, 2SA1156, PNP, 1W, TO-126, -, 40-80	2SA1156-R	SEC, NEC	1	Q2		
13	0505-000123	FET-SILICON, BS170, N, 60V, 500mA, 5ohm, 350mW	BS170-RLRA	ITT, MOT	1	Q4		
14	0604-000118	PHOTO-COUPLER, TR, 20-300%, 200mW, DIP-4, ST	PC814	SHARP, KOC, TSB	1	U2		
15	0604-000119	PHOTO-COUPLER, PC817C, 200-400%	PC817C	SHARP, KOC, TSB	1	U6		
16	0604-000237	PHOTO-COUPLER, PC817, NO-MARKING	PC817	SHARP, KOC, TSB	2	U4-5		
17	1405-000170	VARISROR, 82V, DISC, 9MM	V82ZA2	HARRIS, MATSU	1	VAR1		
18	1405-000226	VARISTOR, 25A, 5mm, TP	VR61BTP	ORIGI	2	VAR2, VAR3		
19	4715-000127	SURGE ABSORBER, MEP, ARRESTER, 2P, 5u11, 300V	DSS-301L-A22R	MITSU	4	ARS1, ARS2, ARS3, ARS4		
20	2001-000065	REF-CARBON, 10Kohm, 5%, 1/4W	CR1/4W, 10K, J	ABCO	1	R6		
21	2001-000294	REF-CARBON, 10M, 5%, 1/4W	CR1/4W, 10M, J	ABCO	1	R7		
22	2001-000626	REF-CARBON, 300, 300ohm, 5%, 1/4W	MR1/4W, 300, F	ABCO	1	R49		
23	2001-000637	REF-CARBON, 30, 2%, 1/2W	CR1/2W, 30, G	ABCO	1	R48		
24	2001-000643	REF-CARBON, 330K, 5%, 1/4W	CR1/4W, 330K, J	ABCO	1	R9		
25	2001-001004	REF-CARBON, 82ohm, 5%, 1/4W	CR1/4W, 82, J	ABCO	1	R4		
26	2007-000002	REF-CHIP, 75Kohm, 5%, 1/10W, 2012	RC2012J753CS	SEM, ROHMK	1	R1		
27	2007-000029	REF-CHIP, 0, 5%, 1/10W, 2012	RC2012J000BS	SEM, ROHMK	3	R26, R27, R42		
28	2007-000033	REF-CHIP.0, 5%, 1/8W, 3216	RC3216J000BS	SEM, ROHMK	2	R36, R50		
29	2007-000033	REF-CHIP.0, 5%, 1/8W, 3216	RC3216J000BS	SEM, ROHMK	30	J2~J4, J6~J8, J10~J33		
30	2007-000282	REF-CHIP, 100K, 5%, 1/10W, 150V	RC2012J104BS	SEM, ROHMK	3	R3, R33, R101		
31	2007-000300	REF-CHIP, 10K, 5%, 1/10W, 150V	RC2012J103BS	SEM, ROHMK	1	R38		
32	2007-000409	REF-CHIP, 15Kohm, 5%, 1/10W, 150V	RC2012J153CS	SEM, ROHMK	2	R30, R40		
33	2007-000465	REF-CHIP, 1Kohm, 1%, 1/10W, 150V	RC2012F1001CS	SEM, ROHMK	1	R11		
34	2007-000468	REF-CHIP, 1K, 5%, 1/10W, 150V	RC2012J102BS	SEM, ROHMK	2	R13, R17		
35	2007-000498	REF-CHIP, 2.2M, 5%, 1/10W, 150V	RC2012J225BS	SEM, ROHMK	2	R22, R24		
36	2007-000572	REF-CHIP, 220ohm, 5%, 1/10W, 2012	RC2012J221CS	SEM, ROHMK	1	R45		
37	2007-000671	REF-CHIP, 2Kohm, 5%, 1/10W, 2012	RC2012J202CS	SEM, ROHMK	1	R51		
38	2007-000686	REF-CHIP, 3.3Kohm, 5%, 1/10W, 2012	RC2012J332CS	SEM, ROHMK	1	R18		
39	2007-000757	REF-CHIP, 330K, 5%, 1/10W, 150V	RC2012J334BS	SEM, ROHMK	3	R10, 21, R23		
40	2007-000774	REF-CHIP, 33K, 5%, 1/10W, 150V	RC2012J333CS	SEM, ROHMK	1	R41		
41	2007-000822	REF-CHIP, 390ohm, 5%, 1/10W, 2012	RC2012J391CS	SEM, ROHMK	1	R46		
42	2007-000859	REF-CHIP, 4.3K, 5%, 1/10W, 151V	RC2012J432CS	SEM, ROHMK	1	R12		
43	2007-000931	REF-CHIP, 470, 5%, 1/10W	RC2012J471CS	SEM, ROHMK	1	R44		
44	2007-000964	REF-CHIP, 5.1K, 5%, 1/10W, 150V	RC3216J512CS	SEM, ROHMK	1	R32		
45	2007-001001	REF-CHIP, 510, 5%, 1/10W	RC2012J511BS	SEM, ROHMK	1	R39		
46	2007-001071	REF-CHIP, 6.8K, 5%, 1/10W, 150V	RC2012J682CS	SEM, ROHMK	1	R2		
47	2007-001177	REF-CHIP, 8.2K, 5%, 1/10W, 150V	RC2012J822CS	SEM, ROHMK	1	R47		
48	2203-000192	CAP-CERAMIC, 100NF, 50V, 5%	CL21F104ZBNC	SEM, MURATA	1	C37		
49	2203-000260	CAP-CERAMIC, 10NF, 50V, 5%, 2012	CL21B103KBNC	SEM, MURATA	4	C11, C47~C49		
50	2203-000374	CAP-CERAMIC, 15NF, 50V, 5%, 2012	CL21B153KBNC	SEM, MURATA	2	C6, C40		
51	2203-000376	CAP-CERAMIC, 15NF, 50V, 5%, 3216	CL31B153KBNC	SEM, MURATA	1	C30		
52	2203-000429	CAP-CERAMIC, 18PF, 5%, 50V, 2012	CL21C180JBNC	SEM, MURATA	1	C27		

53	2203-000455	CAP-CERAMIC, 1NF, 50V, 5%, 5M, NPO	CL21C102JBNC	SEM, MURATA	3	C1, C12, C22
54	2203-000595	CAP-CERAMIC, 220PF, 50V, 5%, 2012	CL31C221JBNC	SEM, MURATA	7	C13~C17, 20, 21
55	2203-000609	CAP-CERAMIC, 22NF, 50V, 5%, 2012	CL21B223KBNC	SEM, MURATA	1	C46
56	2203-000979	CAP-CERAMIC, 47NF, 50V, 5%, 2012	GRM40X7R473K50PT	MURATA, AVX, KY	2	C19, C23
57	2203-001142	CAP-CERAMIC, 68NF, 50V, 5%, 2012	CL21B683KANC	SEM, MURATA	2	C4, C18
58	2305-000218	CAP-FILM, MPEF, 1UF, 250V, 10%	MMT.2E, 105K	SHIN	1	C3
59	2305-000378	CAP-FILM, MPEF, 4.7nF, 10%, 400V	MMY7.5-472K400V	YUCHA	1	C8
60	2401-000042	CAP-AL.ELEC, 100UF, 16V, 20%	1SS1CAB107M	SEM, SAMH	2	C24, C39
61	2401-000217	CAP-AL.ELEC, 100NF, 50V, 20%	1SS1HAB104MAN04007	SEM, SAMH	1	C45
62	2401-000486	CAP-AL.ELEC, 10UF, 50V	CESSM1H100MAAT	SEM, SAMY, SAMH	3	C25, C28, C38
63	2401-000597	CAP-AL.ELEC, 1UF, 50V	CESSM1H010MAAB	SEM, SAMY, SAMH	2	C34, C42
64	2401-000911	CAP-AL.ELEC, 22UF, 16V	CESSM1C220M0507BB	SEM, SAMY, SAMH	1	C44
65	2401-001368	CAP-AL.ELEC, 470UF, 16V	CESSL1C471MAAT	SEM, SAMY, SAMH	1	C32
66	2401-001775	CAP-AL, ELEC, 0.47UF/50V	CESSM1HR47MAAB	SEM, SAMY, SAMH	2	C31, C43
67	2403-000124	CAP-TA, DIPPED, 10uF, 20%, 16V(50v)	TBG1C-100MSS	DAEWO, SPRAG	1	C362403-000123(AM)
68	2404-000151	CAP-TA.ELEC, 1UF, 20%	T491A105M016AS	SEM, AVX, KEMET	1	C10
69	2802-001029	C-RESO, 3.58M, 0.5%:CSA3.58MHz	CSA3.58MG312AM	MURATA	1	X1
70	3501-001025	RELAY-MINIATURE, 12V:2FORM	G6A-234P-BS	OMRON	1	CML1
71	3711-002807	CONN-HEADER, 6P, 2MM, STRAIGHT	35303-0650	MOLEX	1	P3
72	3711-002808	CONN-HEADER, 7P, 2MM, STRAIGHT	35303-0750	MOLEX	1	P4
73	3711-002812	CONN-HEADER, 11P, 2MM, STRAIGHT	35303-1150	MOLEX	1	P2
74	3711-002813	CONN-HEADER, 12P, 2mm, STRAIGHT	35303-1250	MOLEX	1	P1
75	BH39-40305U	WIRE-NO SHEATH, JUMPER WIRE, AWG22(0.6PI)	JUMPER-WIRE	KJEW, LGC	13	JP2, JP3, JP5~JP11, JP13~JP16
76	JB41-10508A	MJ-715S, FR-4, 1L, T1.6mm, 110u90, LIU PCB	LIU PCB	CJE	1	PCB
77	JF13-10073A	I-LIU Chip, STI9510, DIP, 40P	STI9510	AMS	1	U3
78	JF27-30051A	COIL-RF, SF1000, 5.6UH, 1.9OHM	BAL03NA5R6K	BOAM, TAIYO	4	L4~L7
79	JF27-60051A	COIL-FILTER, IND-RF, 60UH	SBT-0260T	TOKIN	2	FLT1-2
80	JG26-50001A	600:600 Transformer, 100-1016	100-1016	SUNGMOON	2	T2, T3

11-5 SF-4500/4500C/Msys4700/4800/MJ-4500C Sensor B'd

NO	SEC CODE	DESCRIPTION	PART NAME	VENDOR	Q'T	PART NUMBER
1	0604-001045	PHOTO-INTERRUPTER, TR, 0.8%-, 100mW, DIP	GP1S94	SHARP	1	S1
2	1209-001016	C-THERMOMETER, DS1621, SOP, 8P	DS1621S	DALLA	1	U1
3	2007-000941	R-CHIP, 47Kohm, 5%, 1/10W	RC2012J473CS	SEM, ROHMK	3	R1, R2, R4
4	2007-000542	R-CHIP, 200ohm, 5%, 1/8W	RC3216J201CS	SEM, ROHMK	1	R3
5	2203-000192	C-CHIP, 100nF, 5%, 50V, NPO, 2012	CL21F104ZBNC	SEM, MURATA	1	C1
6	3708-001198	CONN-FPC, 6P, 1mm, SMD	04-6232-106-103-800	ELCO	1	CN1
7	JB41-10504A	SENSOR PCB	PCB	ZERO	1	PCB

11-6 SF-4500/4500C/Msys4700/4800/MJ-4500C OPE B'd

NO	SEC CODE	DESCRIPTION	PART NAME	VENDOR	Q'T	PART NUMBER
1	0401-000116	DIODE-SWITCHING, MMSD914T1, 100V, 200mA, 225mW, 4ns	MMSD914T1	MOT	1	D8
2	0404-000112	DIODE-SCHOTTKY, RB420D, 25V, 100mA, SOT-23, TPR	B420D T147	ROHM	7	D1~D7
3	0601-000012	LED, CHIP, Y/GRN, 1.5u0.9MM, TP, 25MA	SM2331-H	AUK	7	LED1, LED3-LED8
4	0601-000208	LED, CHIP, RED, 1.5u2mm, 660nm	BR1102W-TR	STANL	1	LED2
5	0604-000229	PHOTO-INTERRUPTER, TR	OS-110703-304	ALEPH, AUK	1	S1
6	0604-001006	PHOTO-INTERRUPTER, TR, DIP-4	OJ-1202	ALEPH	1	S2
7	2007-000033	R-CHIP, 0ohm, 5%, 1/8W, DA, TP, 3216	RC3216J000CS	SEM, ROHMK, BECK	31	J1~J29, R4, R6
8	2007-000303	R-CHIP, 10Kohm, 5%, 1/8W, DA, TP, 3216	RC3216J103CS	SEM, ROHMK	4	R7, R10, R15, R23
9	2007-000403	R-CHIP, 150ohm, 5%, 1/8W, DA, TP, 3216	RC3216J151CS	SEM, ROHMK, BECK	2	R3, R24
10	2007-000542	R-CHIP, 200ohm, 5%, 1/8W, DA, TP, 3216	RC3216J201CS	SEM, ROHMK	3	R8, R12, R13
11	2007-000589	R-CHIP, 22Kohm, 5%, 1/8W, DA, TP, 3216	RC3216J223CS	SEM, ROHMK	9	R11, R14, R16~R22
12	2007-000768	R-CHIP, 330ohm, 5%, 1/8W, DA, TP, 3216	RC3216J331CS	SEM, ROHMK	8	R1, R2, R25~R30
13	2007-001121	R-CHIP, 680ohm, 5%, 1/8W, DA, TP, 3216	RC3216J681CS	SEM, ROHMK	1	R9
14	2203-000208	C-CERAMIC, CHIP, 100nF, 10%, 50V, X7R, 3216	CL31B104KBNC	SEM, MURATA, AVX	6	C3~C5, C7, C12, C13
15	2203-000242	C-CERAMIC, CHIP, 100pF, 5%, 50V, NPO, 3216	CL31C101JBNC	SEM, MURATA, AVX	2	C2
16	2203-000583	C-CERAMIC, CHIP, 220pF, 5%, 50V, NPO, TP, 3216	12065A221KAT2A	MURATA, AVX	3	C6, C10, C11
17	2203-001005	C-CERAMIC, CHIP, 47pF, 5%, 50V, NPO, 3216	CL31C470JBNC	SEM, MURATA, AVX	2	C8, C9
18	2402-000110	C-AL, SMD, 10uF, 20%, 16V, GP, TP, 4u5.2, 1.4mm	CECBX1C100M0405RG	SEM, MATSU, SAMY	1	C1
19	2802-001069	CHIP, RESONATOR-CERAMIC, 7.37MHz	CSACS7.37MT	MURAT	1	OSC1

11-7 SF-4500/4500C/Msys4700/4800/MJ-4500C Hook PBA

NO	SEC CODE	DESCRIPTION	PART NAME	VENDOR	Q'T	PART NUMBER
1	JG41-10090A	PCB-HOOK PCB, SF6000, FR-1, 1L, 1.6T, 50u35MM		CJE	1	PCB
2	3409-000127	SWITCH-HOOK, 60V, 200mA, -, 8mm	SPPY43050A	ALPS	1	SW1
3	3711-000503	CONNECTOR-HEADER, 3WALL, 7P, 1R, 2mm, STRAIGHT, SN	GILS-7P-S2T2-EF(S)	LGC	1	P1

11-8 SF-4500/Msys4700 Others Parts List

NO	SEC CODE	DESCRIPTION	PART NUMBER	VENDER	Q`TY	REFERENCE
1	0609-001030	CONTACT IMAGE SENSOR, MONO, 216mm, 2574, 1.8mS, 1MHz		BN-30216D	CANON 1	CIS
2	GA39-10100A	CBF-HARNESS, PAWER CORD, 220V	25056 (3AFUSE)	KAWAS	1	POWER CORD
3	JB44-10504A	SMPS, AMUNDSEN, AC/DC, 50W, HV, 220V	AMUNDSEN-HV	DYREL, KASHI	1	SMPS
4	JB59-10504A	UNIT-CARTRIDGE, AMUNDSEN, 1382331, COLOR	1382331	LEXMARK	1	CARTRIDGE(COLOR)
5	JB59-10507A	UNIT-CARTRIDGE, AMUNDSEN, 1362731, MONO	1362731	LEXMARK	1	CARTRIDGE(MONO)
6	JC39-40301H	CABLE, MAIN-PRINTER, 36P	A12H04879A	SAMGI, SANCH	1	PRINTER CABLE
7	JF39-50054B	CBF-LINE CORD, TEL, 6P, 3000MM, IVR	STUK10+3M+US4/6(CUT)	SANTA	1	TEL LINE CORD
8	JG07-20001A	DISPLAY-LCD, SF4000, UC-162937-TNAR5-A, BLK/G	UC-162937-TNAR5-A	SEM	1	LCD
9	JG39-41012A	CBF HARNESS-LIU, SF4400, WIRE, UL1007, 190mm	*	SUNJI	1	MAIN-LIU
10	JG39-41013A	CBF HARNESS-LIU GND, SF4400, WIRE, UL1007, 145mm, GRN/Y		*	SUNJI 1	LIU GND
11	JG39-41014A	CBF HARNESS-OPE, SF4400, WIRE, UL1061, 422mm	*	SUNJI	1	MAIN-OPE
12	JG39-41015A	CBF HARNESS-NPO, OPE, SF4400, WIRE, UL1061, 750mm		LIU-OPE1	SUNJI 1	NPO-OPE
13	JG39-41016A	CBF HARNESS-SCAN GND, SF4400, WIRE, UL1007, 288mm, GRN/Y		*	SUNJI 1	SCAN GND
14	JG39-41018A	CBF HARNESS-COLOR CIS, SF4400, WIRE, UL1061, 342mm		*	SUNJI 1	MAIN-COLOR
CIS						
15	JG39-41019A	CBF HARNESS-LCD, SF4400, WIRE, UL2878, 40mm, GRY		*	SUNJI 1	OPE-LCD
16	JG39-41020A	CBF HARNESS-CRADLE, SF4400, WIRE, UL1061, 260mm		*	SUNJI 1	LIU-CRADLE
17	JG39-41024A	CBF HARNESS-MJ, SF4400, WIRE, UL1061, 140mm	*	SUNJI	1	LIU-MJ
18	JG39-41025A	CBF HARNESS-CIS GND, SF4400, WIRE, UL1007, 70mm, GRN/Y		*	SUNJI 1	CIS GND
19	JG39-41026A	CBF HARNESS-NPO, LIU, SF4400, WIRE, UL1061, 750mm		LIU-OPE2	SUNJI 1	NPO-LIU
20	JG39-60503A	CBF-UK CURL CORD, SF4000, 4P, 360MM, IVORY, MODULAR		*	GENYA 1	CURL CORD
21	JG96-00680B	HANDSET, SF6000, SEUK, UK	*	SYI	1	HANDSET

11-9 SF-4500C/Msys4800/MJ-4500C Others Parts List

NO	SEC CODE	DESCRIPTION	PART NUMBER	VENDER	Q`TY	REFERENCE
1	0609-001030	CONTACT IMAGE SENSOR, MONO, 216mm, 2574, 1.5mS, 1MHz		BN-30216D	CANON 1	CIS
2	GA39-10100A	CBF-HARNESS, PAWER CORD, 220V	25056 (3AFUSE)	KAWAS	1	POWER CORD
3	JB44-10504A	SMPS, AMUNDSEN, AC/DC, 50W, HV, 220V	AMUNDSEN-HV	DYREL, KASHI	1	SMPS
4	JB59-10504A	UNIT-CARTRIDGE, AMUNDSEN, 1382331, COLOR	1382331	LEXMARK	1	CARTRIDGE(COLOR)
5	JB59-10507A	UNIT-CARTRIDGE, AMUNDSEN, 1362731, MONO	1362731	LEXMARK	1	CARTRIDGE(MONO)
6	JC39-40301H	CABLE, MAIN-PRINTER, 36P	A12H04879A	SAMGI, SANCH	1	PRINTER CABLE
7	JF39-50054B	CBF-LINE CORD, TEL, 6P, 3000MM, IVR	STUK10+3M+US4/6(CUT)	SANTA	1	TEL LINE CORD
8	JG07-20001A	DISPLAY-LCD, SF4000, UC-162937-TNAR5-A, BLK/G	UC-162937-TNAR5-A	SEM	1	LCD
9	JG39-41012A	CBF HARNESS-LIU, SF4400, WIRE, UL1007, 190mm	*	SUNJI	1	MAIN-LIU
10	JG39-41013A	CBF HARNESS-LIU GND, SF4400, WIRE, UL1007, 145mm, GRN/Y		*	SUNJI 1	LIU GND
11	JG39-41014A	CBF HARNESS-OPE, SF4400, WIRE, UL1061, 422mm	*	SUNJI	1	MAIN-OPE
12	JG39-41015A	CBF HARNESS-NPO, OPE, SF4400, WIRE, UL1061, 750mm		LIU-OPE1	SUNJI 1	NPO-OPE
13	JG39-41016A	CBF HARNESS-SCAN GND, SF4400, WIRE, UL1007, 288mm, GRN/Y		*	SUNJI 1	SCAN GND
14	JG39-41018A	CBF HARNESS-COLOR CIS, SF4400, WIRE, UL1061, 342mm		*	SUNJI 1	MAIN-COLOR CIS
15	JG39-41019A	CBF HARNESS-LCD, SF4400, WIRE, UL2878, 40mm, GRY		*	SUNJI 1	OPE-LCD
16	JG39-41020A	CBF HARNESS-CRADLE, SF4400, WIRE, UL1061, 260mm		*	SUNJI 1	LIU-CRADLE
17	JG39-41024A	CBF HARNESS-MJ, SF4400, WIRE, UL1061, 140mm	*	SUNJI	1	LIU-MJ
18	JG39-41025A	CBF HARNESS-CIS GND, SF4400, WIRE, UL1007, 70mm, GRN/Y		*	SUNJI 1	CIS GND
19	JG39-41026A	CBF HARNESS-NPO, LIU, SF4400, WIRE, UL1061, 750mm		LIU-OPE2	SUNJI 1	NPO-LIU
20	JG39-60503A	CBF-UK CURL CORD, SF4000, 4P, 360MM, IVORY, MODULAR		*	GENYA 1	CURL CORD
21	JG96-00680B	HANDSET, SF6000, SEUK, UK	*	SYI	1	HANDSET

<SF-4500/4500C Power B'd Parts List>

NO	ITEM	PART NUMBER	DESCRIPTION	VENDER	Q`TY	LOCATION
1001	IC-SHUNT REG	KA431AZ	40V 0.1A	SAMSUNG	1	U1
1001-A		KIA431Z		KEC		
1002	IC-REGULATOR	KA7805P	5V 1A	SAMSUNG	1	U2
1002-A		KIA7805P		KEC		
1003	DIODE-SWITCHING	1N4148	75V 0.15A	ROHM KOREA	1	D1
1003-A		1N4148		UNIZON		
1004	DIODE-SCHOTTKY	1N5822	40V 2.5A	MICRO SEMI	1	D2
1004-A		D3S6M	60V 2.5A	SHINDENGEN		
1005	DIODE-F.R	SF34	200V 3A	MICRO SEMI	1	D3, D4
1005-A		S3L20U		SHINDENGEN		
1006	DIODE-ZENER	MTZ20C	0.5W 20V	ROHM KOREA	1	ZD1
1006-A		UZ20BSC		UNIZON		
1007	DIODE-ZENER	MTZ6.2C	0.5W 6.2V	ROHM KOREA	1	ZD2
1007-A		UZ6.2BSC		UNIZON		
1008	DIODE-ZENER	TZP15B	1.0W 15V	ROHM KOREA	1	ZD3
1008-A		UZP15B		UNIZON		
1009	FET	SSP5N80A	800V 5A	SAMSUNG	1	Q1
1009-A						
1010	TR	KSC5020-0	500V 3A	SAMSUNG	1	Q2
1011	TR-SWITCHING	KSC1008-Y	80V 0.7A	SAMSUNG	2	Q3, Q4
1012	PHOTO-COUPLER	PC817XF	5KVac 50mA	SHARP	1	PC1
1012-A		LTV817		LITEON		
1013	DIODE-BRIDGE	D2SB(A)60	600V 2A	SHINDENGEN	1	BD1
2001	CAP-X	KNB1530-154	AC275V 154M MINI	ISKRA	2	C1, 4
2001-A		PCX2 335M 154	TYPE	PILKOR		
2002	CAP-Y	HCYE2G222MAA	AC275V 154M (17*15*8)	SAMSUNG	2	C2, 3
2002-A		SCE2G222M08BS7	AC100V 222M	SAMHWA		
2003	CAP-Y	HCYE2G222MAD	VDE(2600V)	SAMSUNG	1	C6
2003-A		SDE2G222M10BS1	AC400V 222M (4000V)	SAMHWA		
2004	CAP-ELEC	SMG400V150uF		SAMYOUNG	1	C7
2004-A		HC400V150uF	400V 150uF 25*30	SAMHWA		
2005	CAP-ELEC	SXE16V820uF		SAMYOUNG	1	C14
2005-A		RX16V820uF	16V 820uF 10*25	SAMHWA		
2006	CAP-ELEC	SMS25V47uF		SAMYOUNG	2	C16, 23
2006-A		SG25V47uF	25V 47uF 5*11	SAMHWA		
2007	CAP-ELEC	SXE50V330uF		SAMYOUNG	2	C17, 18
2007-A		RX50V330uF	50V 330uF 10*30	SAMHWA		
2008	CAP-ELEC	SXE25V560uF		SAMYOUNG	2	C20, 21
2008-A		RX25V560uF	25V 560uF 10*25	SAMHWA		
2009	CAP-ELEC	SRE50V1uF		SAMYOUNG	1	C22
2009-A		SE50V1uF	50V 1uF 3.5*5	SAMHWA		
2010	CAP-ELEC	SMS50V22uF		SAMYOUNG	1	C19
2010-A		SG50V22uF	50V 22uF 5*11	SAMHWA		
2011	CAP-CERAMIC	CKR3A221K06BS		SAMHWA	1	C9

<SF-4500/4500C Power B'd Parts List (cont.)>

NO	ITEM	PART NUMBER	DESCRIPTION	VENDER	Q`TY	LOCATION
2011-A		HCYB3A221KDS	1KV 221K BL	SEMCO		
2012	CAP-CERAMIC	CKR3A101K06BS		SAMHWA	1	C12
2012-A		HCYB3A101K06BS	1KV 101K BL	SEMCO		
2013	CAP-CERAMIC	CCYV1H104ZF		SEMCO	1	C15
2013-A		CGF1H104ZFK	50V 104Z	SAMHWA		
2014	CAP-MYLAR	TY2A223J		SAMHWA	1	C10
2014-A		TS1H223J	100V 223J	SAMHWA		
2015	CAP-MYLAR	TY2A683J	50V 223J	SAMHWA	1	C11
2015-A		CQ92MST2A683J	100V 683J	DONGSUNG		
2016	CAP-M.F	TM2J333K		SAMHWA	1	C8
2016-A		MMW630V333K	630V 333K	DONGSUNG		
3001	R-VARIABLE	EVNDJAA03B52		MATSUSHITA	1	VR1
3002	R-METAL	1/2W 560K-J MINI	1/2W 500Ω TOP ADJ	PILKOR	1	R1
3002-A				ABCO		
3003	R-METAL OXIDE	1W 330K-J MINI		PILKOR	2	R2, 3
3003-A				ABCO		
3004	R-METAL OXIDE	1W 68-J MINI		PILKOR	1	R4
3004-A				ABCO		
3005	R-METAL OXIDE	1W 470-J MINI		PILKOR	1	R5
3005-A				ABCO		
3006	R-METAL	1/8W 100-J		PILKOR	1	R6
3006-A				ABCO		
3007	R-METAL	1/8W 47K-J		PILKOR	1	R7
3007-A				ABCO		
3008	R-METAL OXIDE	1W 0.47-J MINI		PILKOR	2	R8, 9
3008-A				ABCO		
3009	R-METAL	1/8W 330-J		PILKOR	1	R10
3009-A				ABCO		
3010	R-METAL	1/4W 360-J		PILKOR	1	R11
3010-A				ABCO		
3011	R-METAL OXIDE	1W 110-J MINI		PILKOR	1	R12
3011-A				ABCO		
3012	R-METAL	1/8W 4.7K-J		PILKOR	1	R13
3012-A				ABCO		
3013	R-METAL	1/8W 68-J		PILKOR	1	R14
3013-A				ABCO		
3014	R-METAL	1/8W 10K-J		PILKOR	1	R15
3014-A				ABCO		
3015	R-METAL	1/8W 2.4K-J		PILKOR	1	R16
3015-A				ABCO		
4001	THERMISTOR	DSC 10D-9		SHINHO	1	NT1
4001-A		NTC 10D-9	10ohm 9pi	SAMKYUNG		
4002	SURGE ABSORBER	JVR14N471K UL		JOYIN	1	TNR1
4002-A		SVC471D-14A		SAMHWA		
4003	BEAD CORE	BFD3550R2F		SAMHWA	1	B1
4003-A		RTD3550S(R2)				
4004	BEAD CORE	BFS3550R2F		SAMHWA	2	B2, B4

<SF-4500/4500C Power B'd Parts List (cont.)>

NO	ITEM	PART NUMBER	DESCRIPTION	VENDER	Q`TY	LOCATION
4004-A		RTS3550S(R1)				
4005	BEAD CORE	F-FB35T			1	B3
			3.5*6*1			
4005	OUTPUT HARNESS	IFPS HARNESS			1	CON1
			6PIN 320mm			
4006	GND WIRE ASS'Y	IFPS G/W - 1			1	LUG2
			150mm GREEN			
4008	GND WIRE ASS'Y	IFPS G/W - 2			1	LUG3
			215mm GREEN/YELLOW			
4009	INLET	BCP-03A		BAE EUN	1	INLET
4009-A		0714-FR7		INALWAYS		
4010	LINE FILTER	US35060		BUJEON	2	LF1,2
4010-A			UU1116 0.35*60T	YOUNHWA		
4011	CHOKE-COIL	BAR5*20(15.5TS)		NAMYANG	1	L1
4011-A			5.5 uF	DONGHEUNG		
4012	TRANSFORMER	IFPS-V1/V3		SUNGWON	1	PT1
4012-A			IPT-1/3	ASEA		
4012-B		FC51F		DONGYANG		
4013	CLIP FUSE			TRIAD	2	FOR F1
		51S 020H (¿,)				
4014	FUSE-GLASS			TRIAD	1	F1
		IFPS	250V 2.0A			
4015	SHIELD PLATE				1	
4015-A			SECC T=1.0			
4016	PCB	IFPS-V3			1	
4016-A			FR-1 1.6T		1	
4017	LABEL POWER	IFPS-V3		SAMSUNG PRINT-	4	
4018	SCREW-FG	MSBH 4*6		EC	2	
4019	SCREW	MSBH 3*6	SCREW + WASHER	DAEKYUNG	8	
4020	SCREW	MSBH 3*10	TAPTITE GLD	DAEKYUNG	2	J1~J4,
4021	WIRE JUMPER	0.6mm	GLD	DAEKYUNG		J6~J9
4022	SILICON RUBBER	TUBE 9.5*27		SAMEUN	2	Q1,2
4022-A		CAP TO-220	0.45T			
4023	CLAMP*TR4	SPCC 1.6T	0.45T	APEX		
4023-A				DONG IL		
4024	SOLDER WIRE	SN63% 1.0				
4025	SOLDER BAR	SN60%				
4026	AUTO(POST)FLUX	JS-90TVS			1	
4027	THINNER	4662M		SANKEI KOREA	2	
4028	LUG GROUND	4ø0.5T		KESTER		LUG1
4029	LUG GROUND	3ø0.5T				LUG2,

<Msys4700/4800/MJ-4500C Power B'd Parts List >

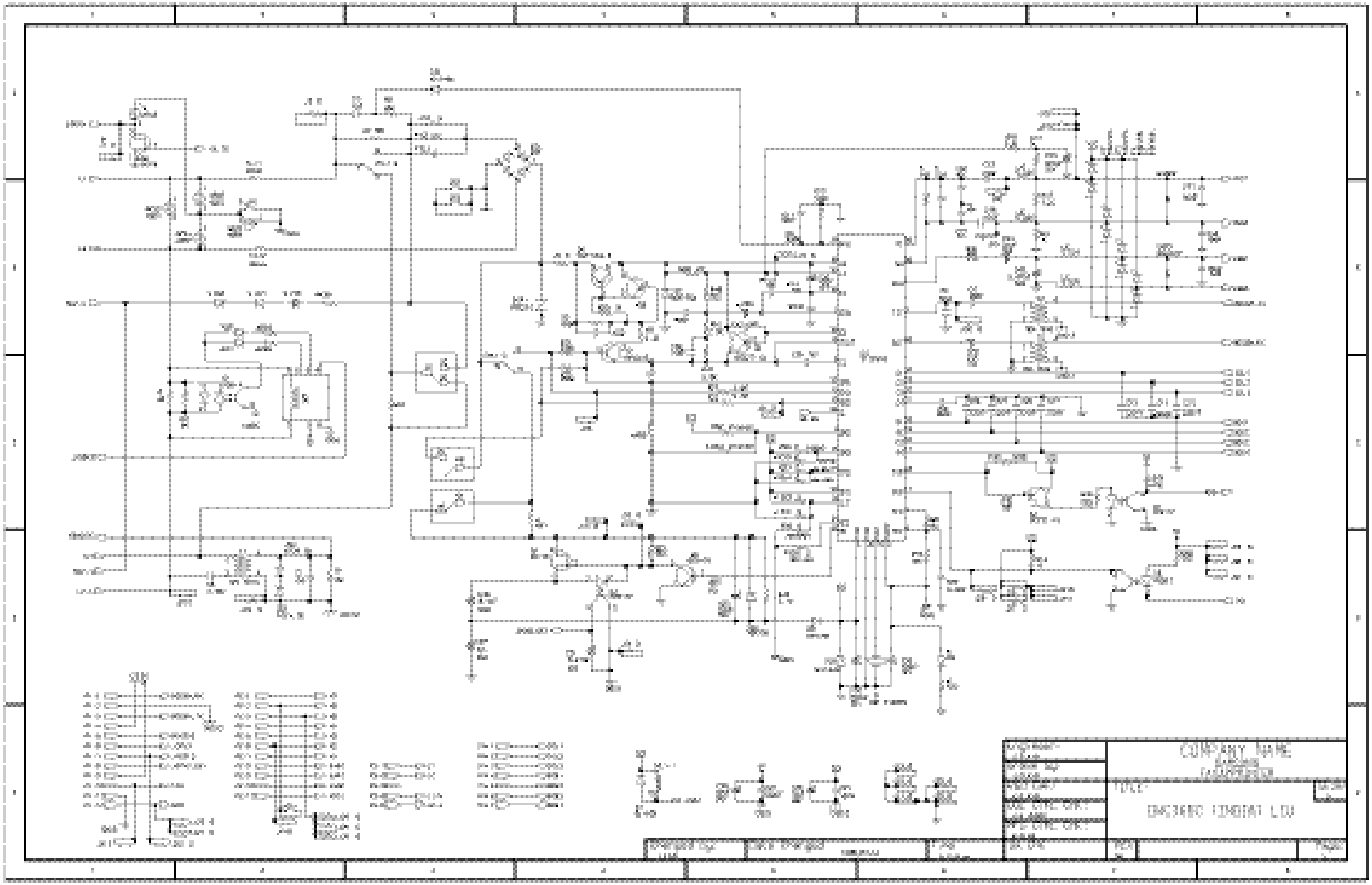
NO	ITEM	PART NUMBER	DESCRIPTION	VENDER	Q`TY	LOCATION
1001	IC-SHUNT REG	KA431AZ	40V 0.1A	SAMSUNG	1	U1
1001-A		K1A431Z		KEC		
1002	IC-REGLLATOR	KA7805P	5V-1A	SAMSUNG	1	U2
1002-A		K1A7805P		KEC		
1003	DIODE-SWITCHING	1N4148	75V 0.15A	ROHM KOREA	1	D1
1003-A		1N4148		UNIZON		
1004	DIODE-SCHOTTKHY	1N5822	40V 2.5A	MICRO SEMI	1	D2
1004-A		D3S6M	60V 2.5A	SHINDENGEN		
1005	DIODE-F.R	SF34	200V 3A	MICRO SEMI	2	D3, D4
1005-A		S3L20U		SHINDENGEN		
1006	DIODE-ZENER	MTZ2OC	0.5W 20V	ROHM KOREA	1	ZD1
1006-A		UZ20BSC		UNIZON		
1007	DIODE-ZENER	MTZ6.2C	0.5W 6.2V	ROHM KOREA	1	ZD2
1007-A		UZ6.2BSC		UNIZON		
1008	DIODE-ZENER	TZP15B	1.0W 15V	ROHM KOREA	1	ZD3
1008-A		UZP15B		UNIZON		
1009	FET	IRF830	800V 4.5A	SAMSUNG	1	Q1
1009-A		IRF830A		SAMSUNG		
1010	TR	KSC5020-0	500V 3A	SAMSUNG	1	Q2
1011	TR-SWITCHING	KSC1008-Y	80V 0.7A	SAMSUNG	2	Q3.4
1012	PHOTO-COUPLER	PC817XF	5KVac 50mA	SHARP	1	PCI
	LTV817		LITEON			
1013	DIODE-BRIDGE	D2SB(A)60	600V 2A	SHINDENGEN	1	BD1
2001	CAP-X	KNB1530-104	AC250V 104M	ISKRA	2	C1.4
2001-A		PX2 335 104	AC275V 104M	PHILKOR		
2002	CAP-Y	HCYE2G222MAA	AC400V 222M VDE	SAMSUNG	3	C2, 3, 6
2002-A		SCE2G222M		SAMHWA		
2003	CAP-ELEC	SMG200V200uF	200V 220uF 22*25	SAMYOUNG	1	C7
2003-A		HC200V220uF		SAMHWA		
2004	CAP-ELEC	SXE16V820uF	16V 820uF 10*25	SAMYOUNG	1	C14
2004-A		RX16V820uF		SAMHWA		
2005	CAP-ELEC	SMS25V47uF	25V 47uF 5*11	SAMYOUNG	2	C16, 23
2005-A		SG25V47uF		SAMHWA		
2006	CAP-ELEC	SXE50V330uF	50V 330uF 10*30	SAMYOUNG	2	C17,18
2006-A	RX50V330uF			SAMHWA		
2007	CAP-ELEC	SXE25V560uF	25V 560uF 10*25	SAMYOUNG	2	C20, 21
2007-A		RX25V560uF		SAMHWA		
2008	CAP-ELEC	SRE50V1uF	50V 1uF 3.5*5	SAMYOUNG	1	C22
2008-A		SE50V1uF		SAMHWA		
2009	CAP-ELEC	SAMS50V22uF	50V 22uF 5*11	SAMYOUNG	1	C19
2009-A		SG50V22uF		SAMHWA		
2010	CAP-CERAMIC	CKR3A470K06BS	1KV 471K BL	SAMHWA	1	C9
2010-A		HCYB3A471KDS		SEMCO		
2011	CAP-CERAMIC	CKR3A101K06BS	1KV 101K BL	SAMHWA	1	C12

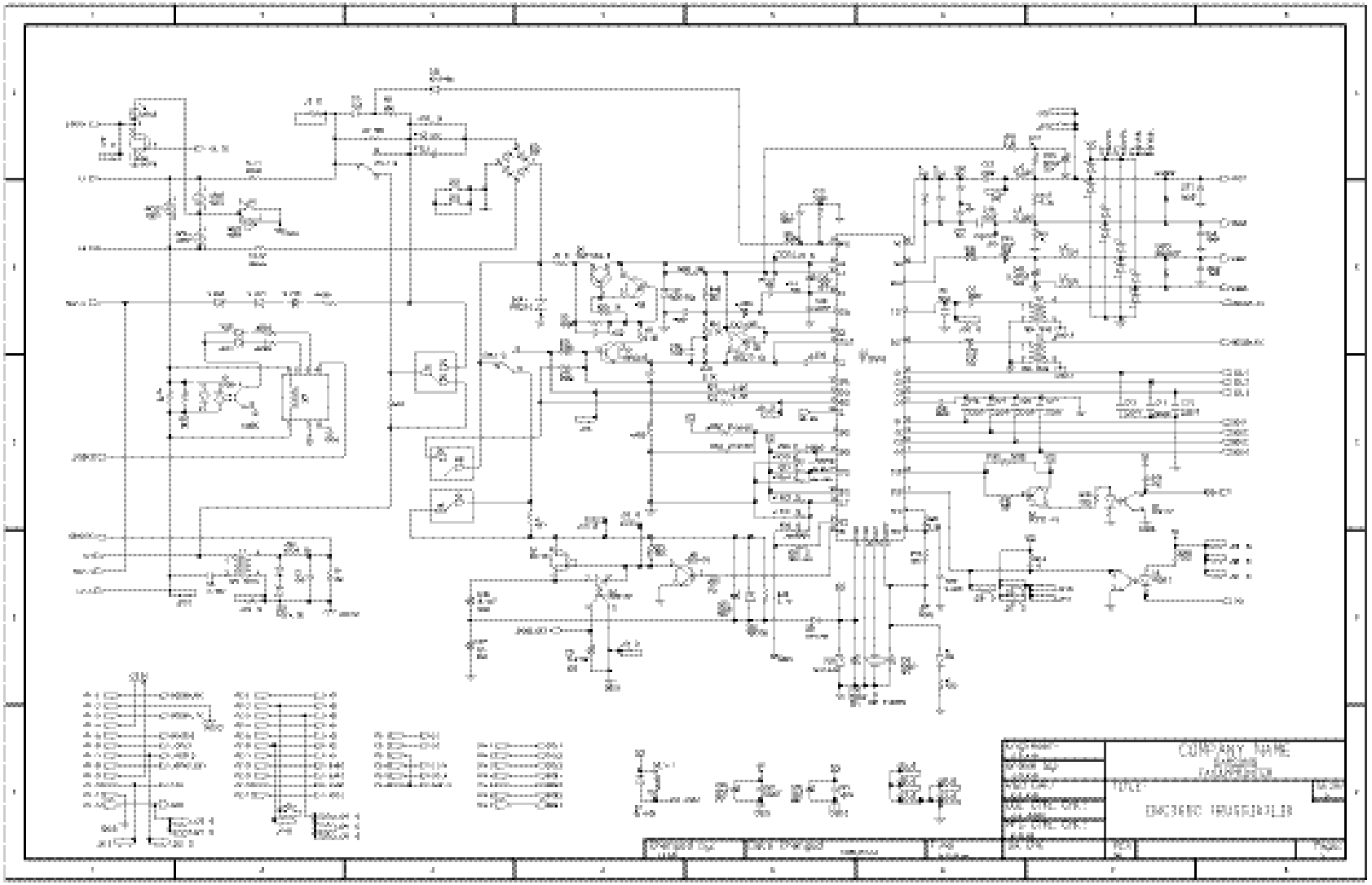
<Msys4700/4800/MJ-4500C Power B'd Parts List (cont.)>

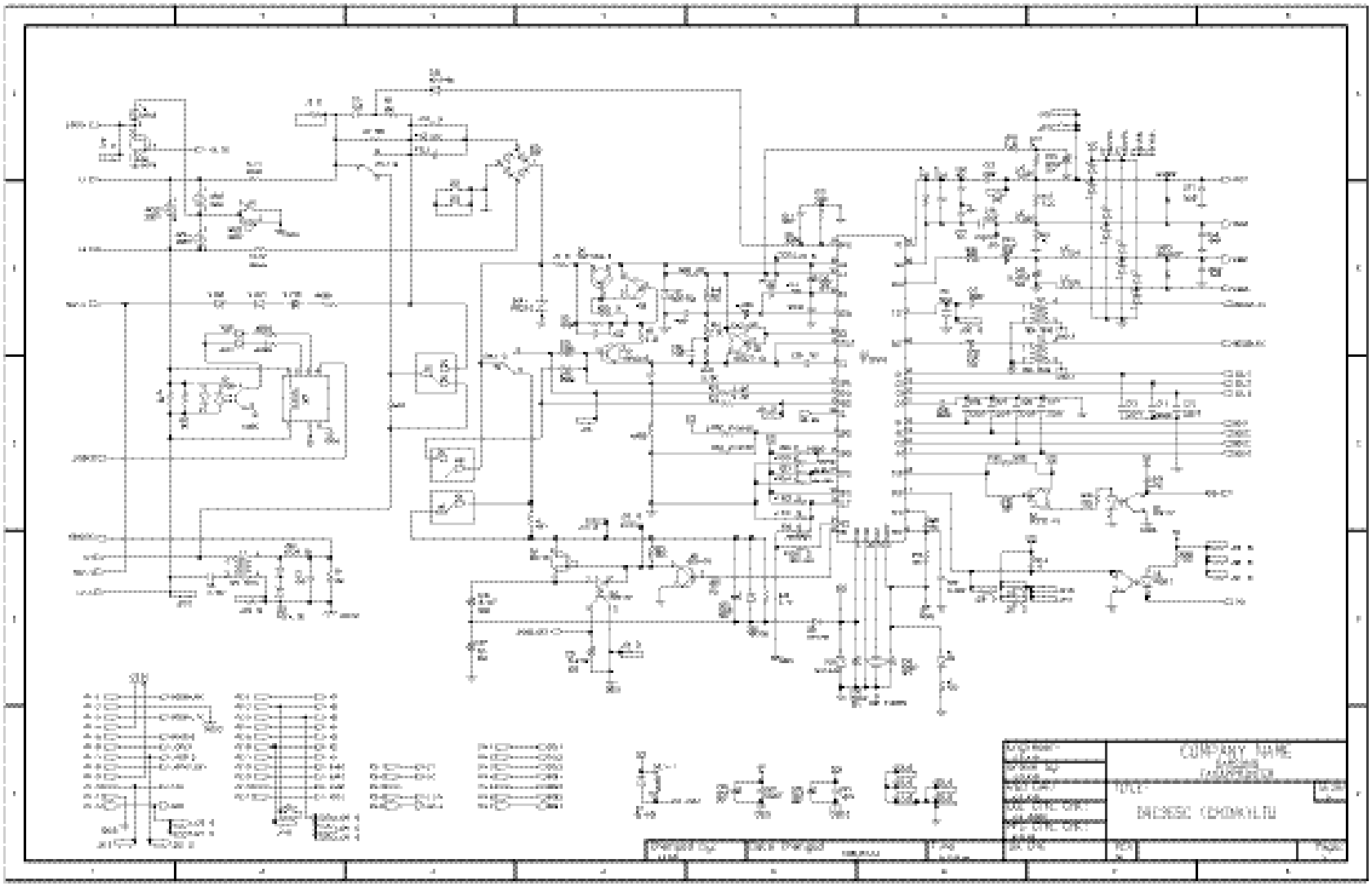
NO	ITEM	PART NUMBER	DESCRIPTION	VENDER	Q`TY	LOCATION
2011-A		HCYB3A101KDS		SEMCO		
2012	CAP-CERAMIC	CCYV1H104ZF	50V 104Z	SEMCO	1	C15
2012-A		CGF1H104ZFK		SAMHWA		
2013	CAP-MYLAR	TY2A223J	100V 223J	SAMHWA	1	C10
2013-A		TS1H223J	50V 223J	SAMHWA		
2014	CAP-MYLAR	TY2A686J	100V 683J	SAMHWA	1	C11
2015	CAP-M.F	TL2J683K	630V 683K	SAMHWA	1	C8
3001	R-VAR1ABLE	EVNDJAA03B52	1/2W 500 TOP ADJ	MATSUSHITA	1	C8
3002	R-METAL	1/2W 560K-J	NORMAL TYPE L:9mm	ABC0	1	R1
3002-A	R-M.O	1W 560K-J	MINI TYPE	PILKOR		
3002-B				ABCO		
3003	R-METAL OXIDE	1W 220K-J MINI		PHILKOR	2	R2,3
3003-A				ABCO		
3004	R-METAL OXIDE	1W 680-J MINI		PHILKOR	1	R4
3004-A				ABCO		
3005	R-METAL OXIDE	1W680-J MINI		PHILKOR	1	R5
3005-A				ABCO		
3006	R-METAL	1/8W 100-J		PHILKOR	1	R6
3006-A				ABCO		
3007	R-METAL	1/8W 47K-J		PHILKOR	1	R7
3007-A				ABCO		
3008	R-METAL OXIDE	1W 0.47-J MINI		PHILKOR	2	R8,9
3008-A				ABCO		
3009	R-METAL	1/8W 330-J		PHILKOR	1	R10
3009-A				ABCO		
3010	R-METAL	1/4W 330-J		PHILKOR	1	R11
3010-A				ABCO		
3011	R-METAL OXIDE	1W 110-J MINI		PHILKOR	1	R12
3011-A				ABCO		
3012	R-METAL	1/8W 4.7K-J		PHILKOR	1	R13
3012-A				ABCO		
3013	R-METAL	1/8W 68-J		PHILKOR	1	R14
3013-A				ABCO		
3014	R-METAL	1/8W 10K-J		PHILKOR	1	R15
3014-A				ABCO		
3015	R-METAL	1/8W 2.4K-J		PHILKOR	1	R16
3015-A				ABCO		
4001	CHERMISTOR	DSC 10D-9	10OHM 9PI	SHINHO	1	NT1
4001-A		NTC 10D-9		SAMKYUNG		
4002	SURGE ABSORBER	JVR14N221K UL		JOYIN	1	TNR1
4002-A		INR14D221K		ILJIS		
4003	SURGE ABSORBER	D69Z0V102RA220		MAIDA	1	TNR2
4004	BEAD CORE	BFD3550R2F		SAMHWA	1	B1
	RTD3550S (R2)		NAMYANG			

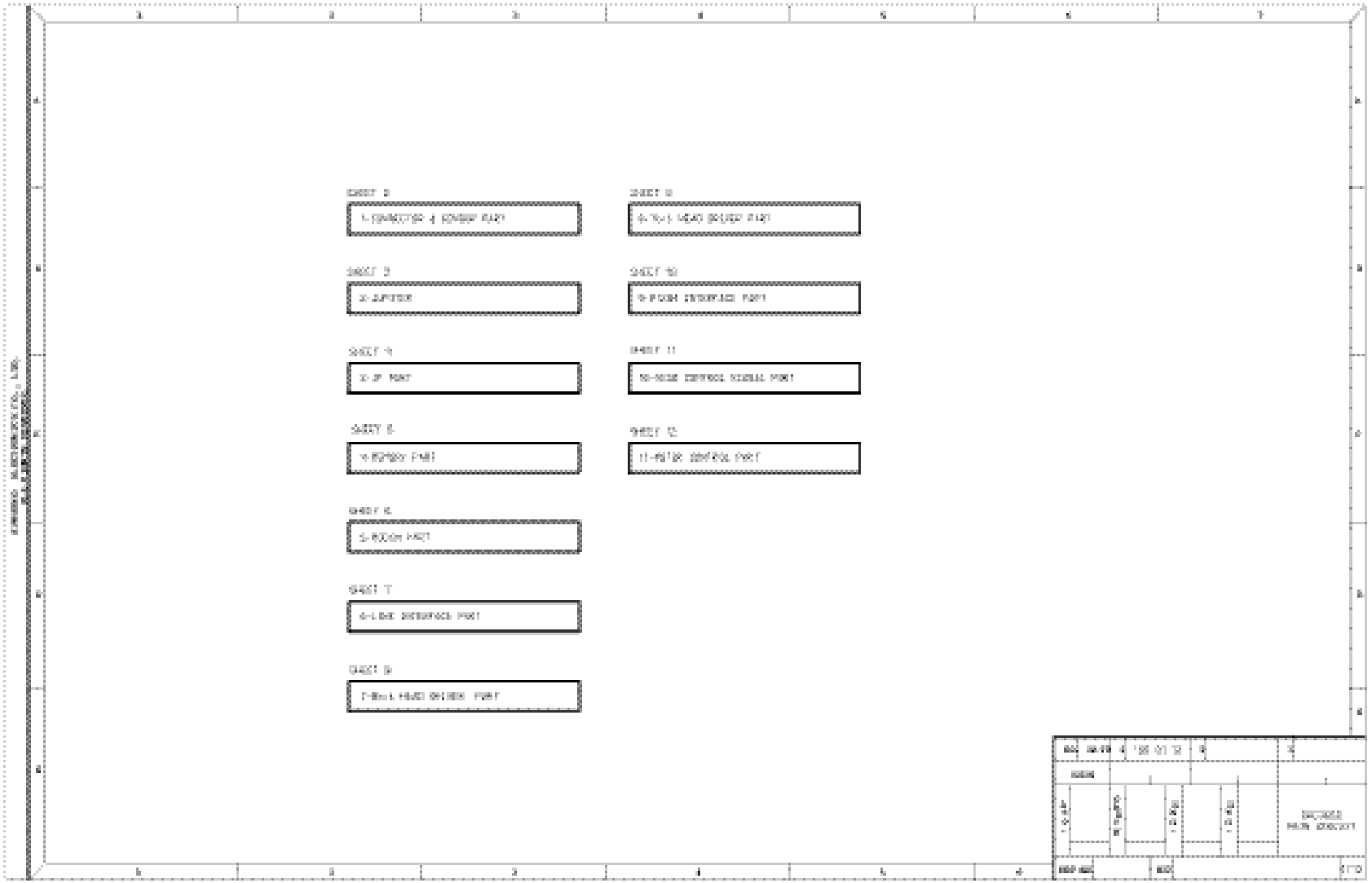
<Msys4700/4800/MJ-4500C Power B'd Parts List (cont.)>

NO	ITEM	PART NUMBER	DESCRIPTION	VENDER	Q`TY	LOCATION
4005	BEAD CORE	BFS3550R2F		SAMHWA	2	B2,B4
	RTS3550S (R1)		NAMYANG			
4006	BEAD CORE	F-FB35T	3.5*6*1	NAMYANG	1	B3
4007	OUTPUT HARNESS	IFPS HARNESS	6PIN 330mm	SHINJIN	1	CON1
			SEOIL			
4008	GND WIRE ASS'Y	IFPS G/W-1	150mm GREEN	SHINJIN	1	LUG2
			SEOIL			
4009	GND WIRE ASS'Y	1FPS G/W-2	190mm GREEN/YELLOW	SHINJIN	1	LUG3
			SEOIL			
4010	INLET	BCP-03A		BAE EUN	1	INLET
4010-A		0714-FR7		INALWAY		
4011	LINE FILTER	US40040	UU1116 0.4*40T	BUEON	2	LF1.2
4011-A				YOUNHWA		
4012	CHOKE-COIL	BAR5u20 (15. 6TS)	5.5IN	NAMYANG	1	U1
4012-A				DONGHEONG		
4013	TRANSFORMER	1FPS-V1/V3	1PT-1/3	SUGNWON	1	PT1
4013-A				DONGYANG		
4013-B				ASEA		
4014	CLIP FUSE	FC51F		TRIAD	1	F1
4015	FUSE-GLASS	51S 020L	125V 2.0A	TRIAD	1	F1
4016	SHIELD PLATE 1FPS	1FPS	SECC T=1.0	SHENWOO	1	
4016-A				YUCHANG		
4017	PCB	1FPS-V1	FR-1 1.6T	CHUNGJU	1	
4017-A				GANA		
4018	LABEL	1FPS-V1		SAMSUNG PRINTEC	1	
4019	SCREW-FG	MSBE 4*6	SCREW+WASHER	DAEKYUNG	1	
4020	SCREW	MSBH 3*6	TAPTITE GLD	DAEKYUNG	4	
4021	SCREW	MSBH 3*10	GLD	DAEKYUNG	2	
4022	WIRE	JUMPER	0.6mm	SAMEUN	8	J1~J4
J6~19						
4023	SILICON RUBBER	TUBE 9.5*27	0.45T	MYUNGSUNG	2	Q1,2
4023-A		CAP T0-220	0.45T	APEX		
4024	CLAMP-TR4	SPCC 1.6T		DONG IL	2	
4024-A				YUCHANG		
4024-B	CLAMP-TR		1FPS	YUCHANG		
4025	SOLDER WIRE	SN63% 1.0		SEOUL		
4026	SOLDER BAR	SN60%		SEOUL		
4027	AUTO(POST)FLUX	JS-90TVS		SANKEI KOREA		
4028	THINNER	4662SM		KESTER		
4029	LUG GROUND	4x 0.5T		DONG IL	1	LUG1
4030	LUG GROUND	3x 0.5T		DONG IL	2	LUG2, LUG3





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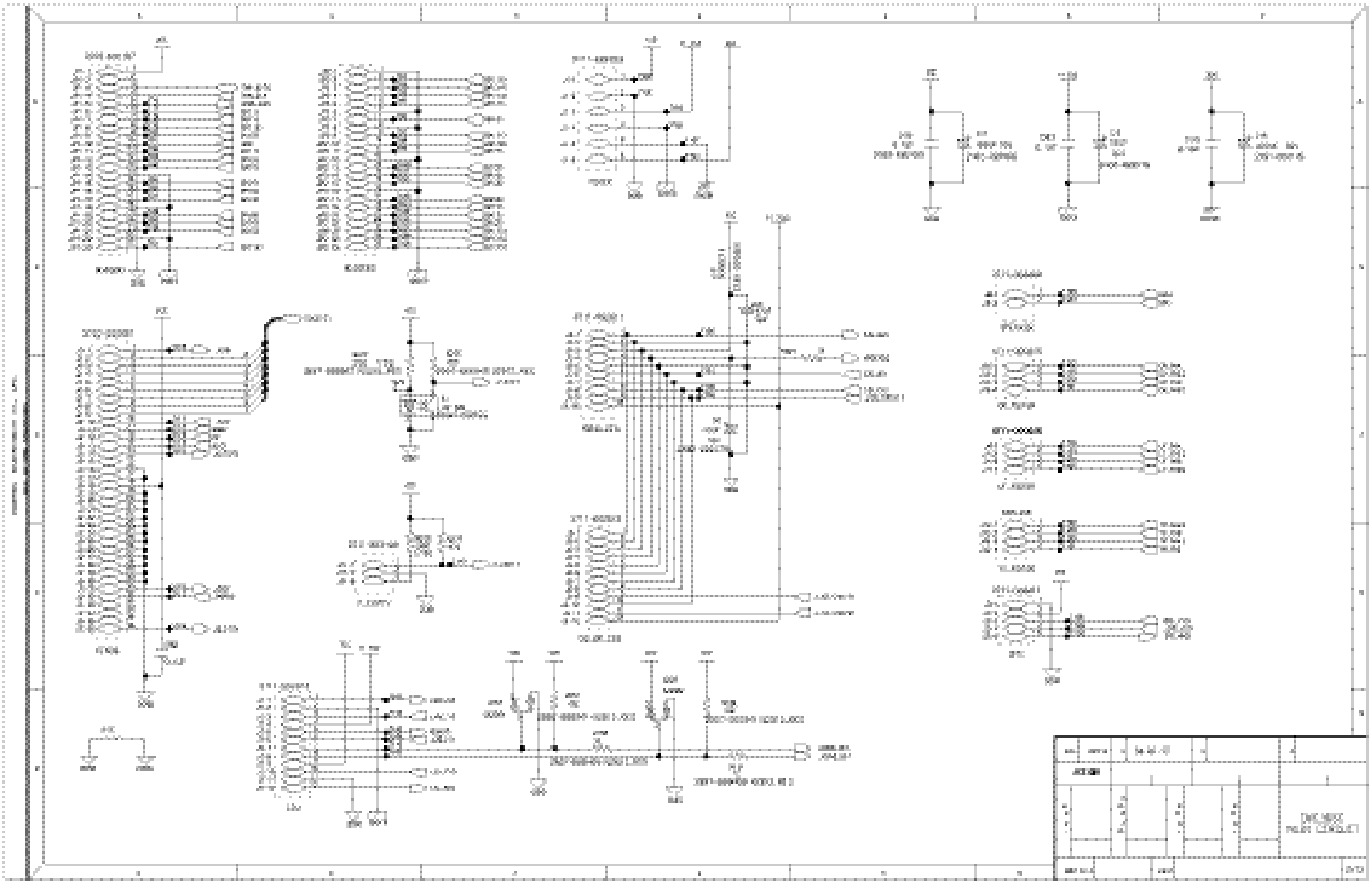
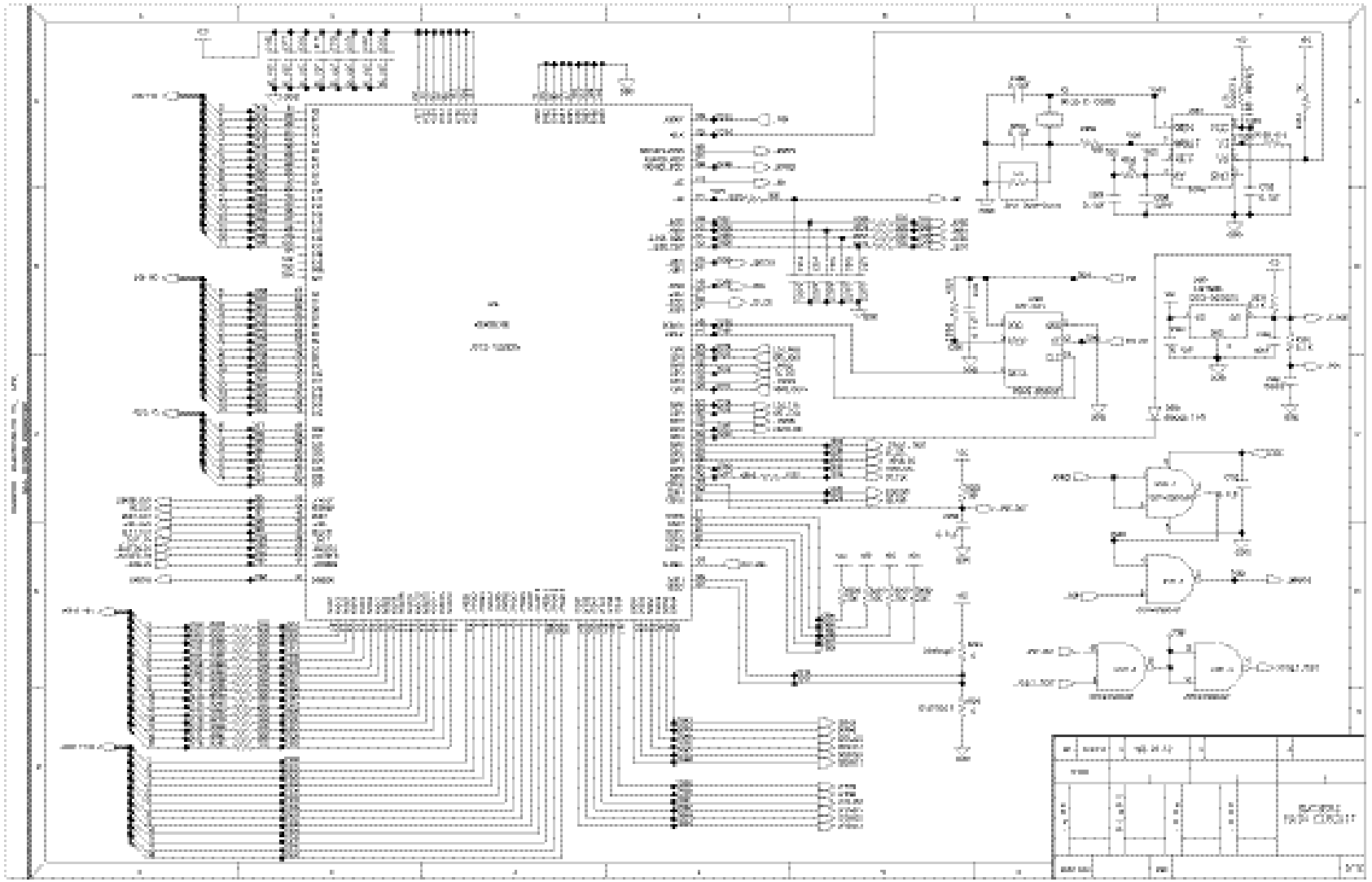
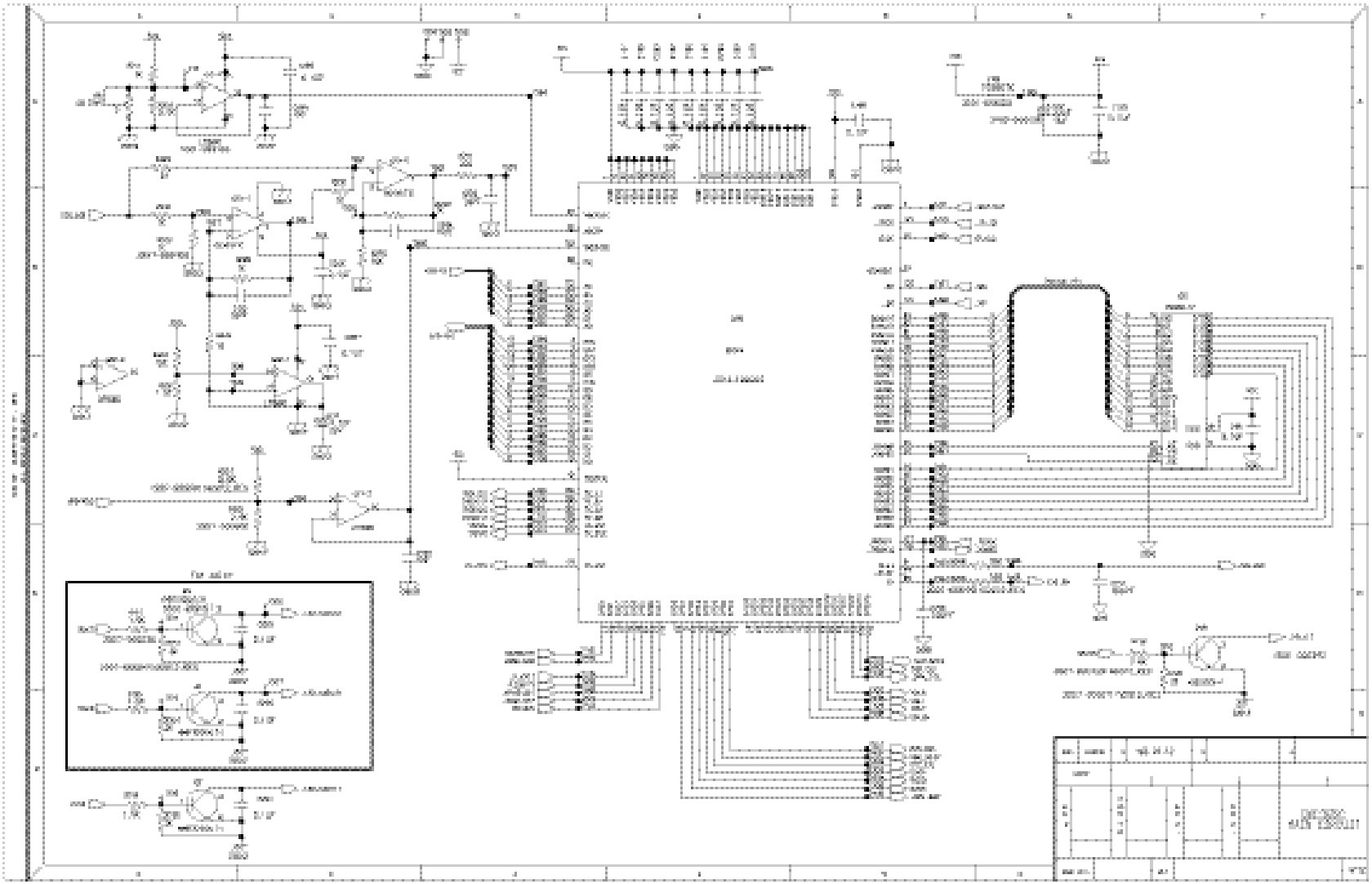
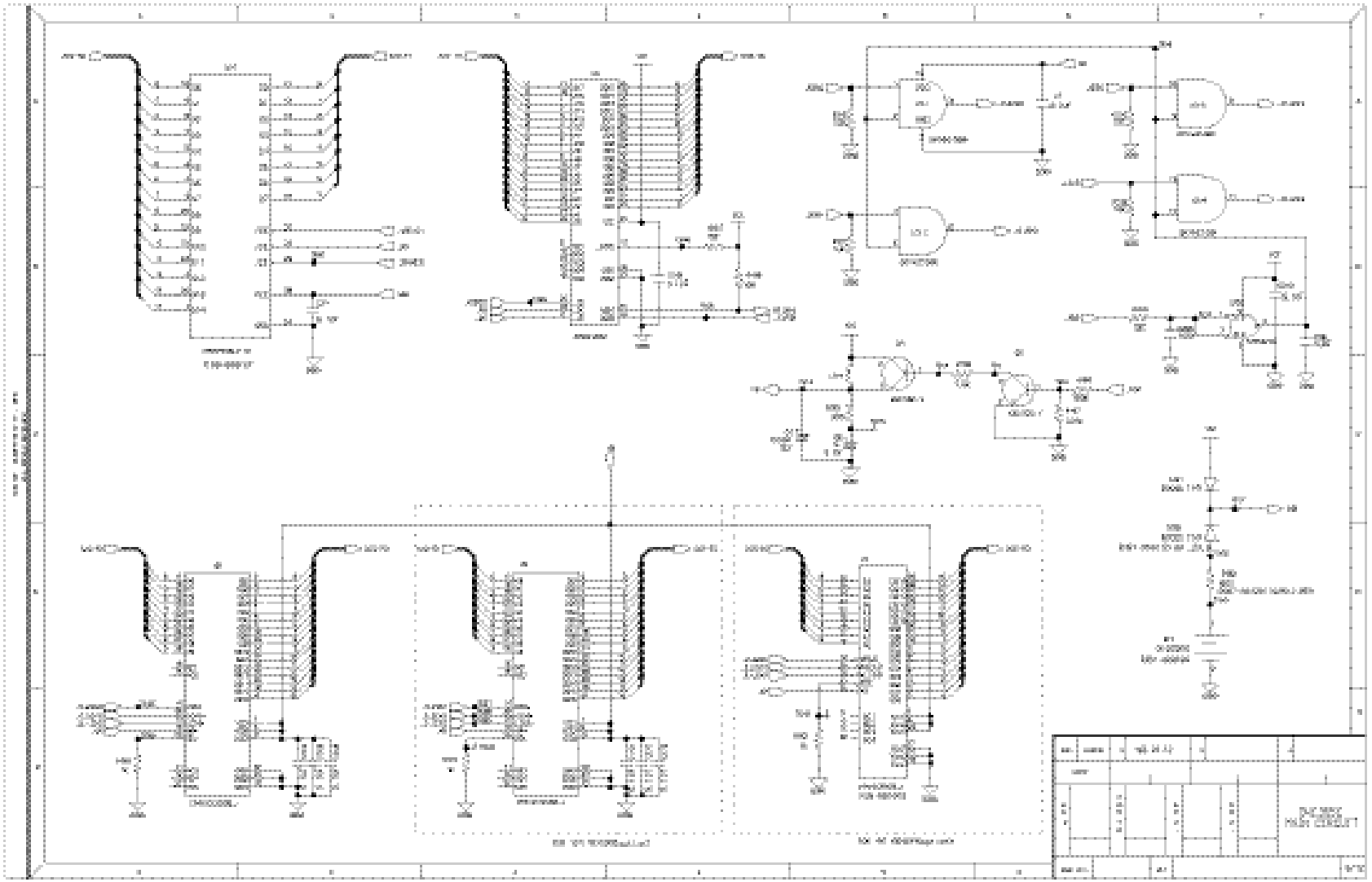
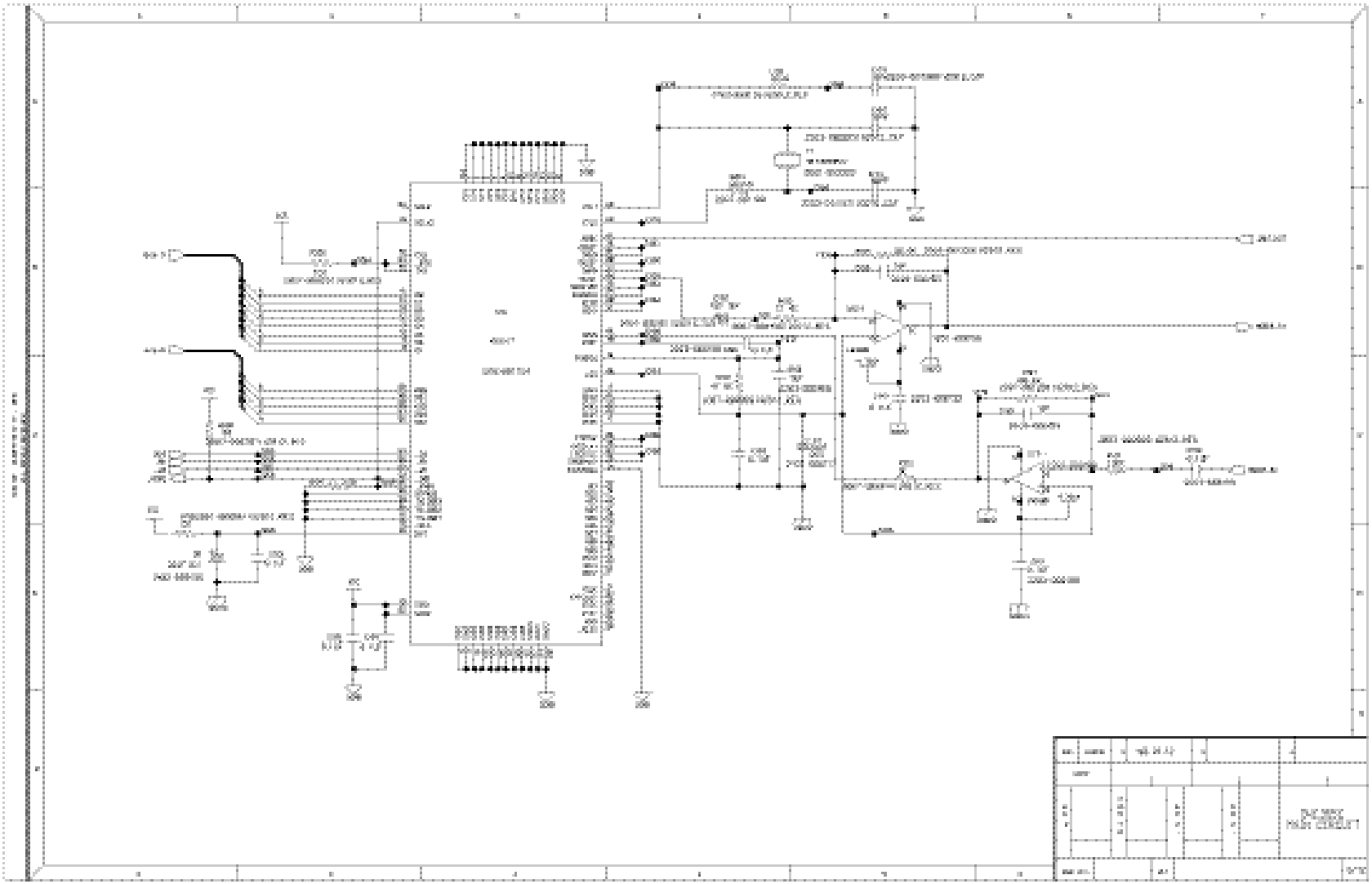
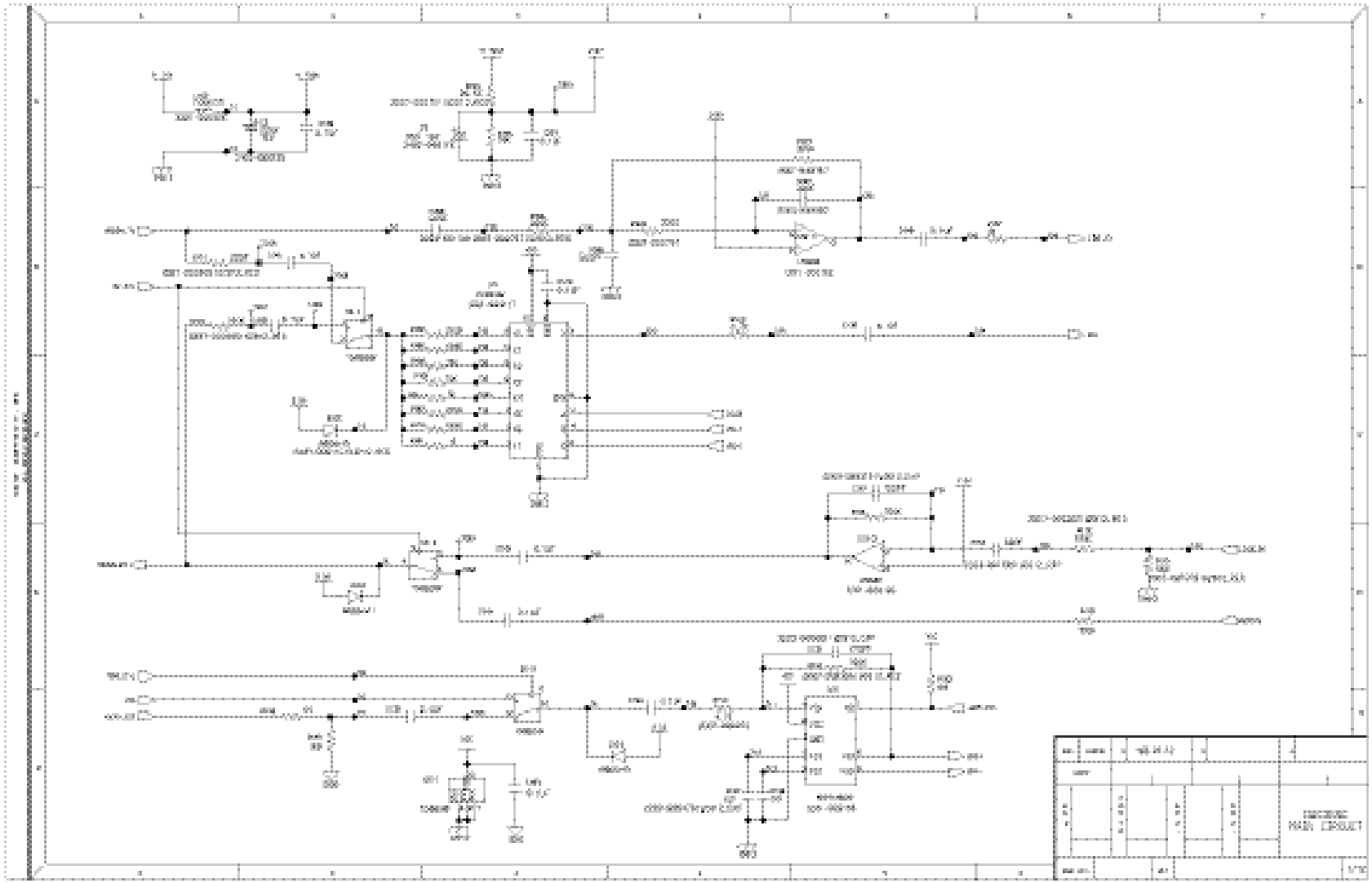


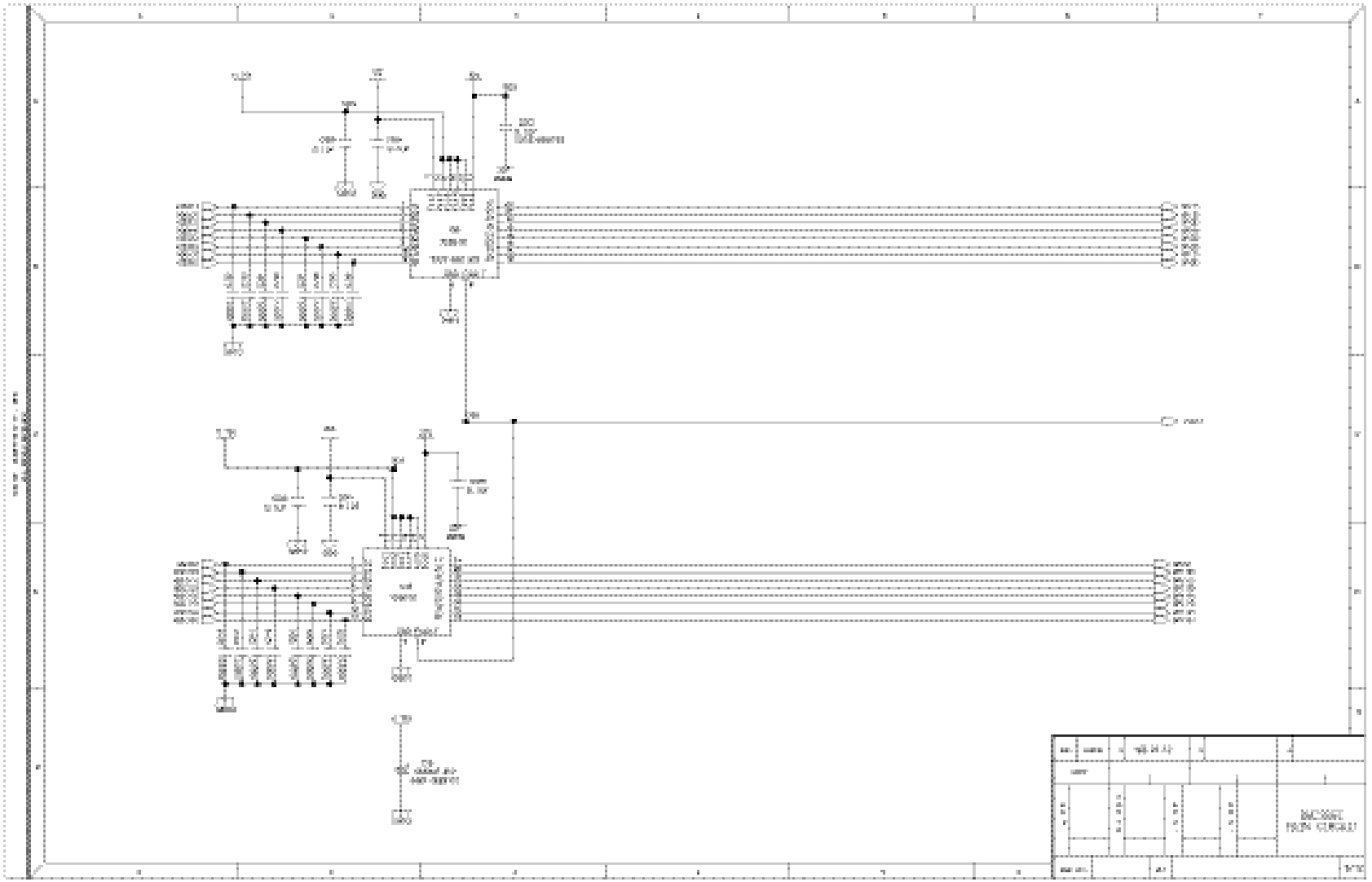


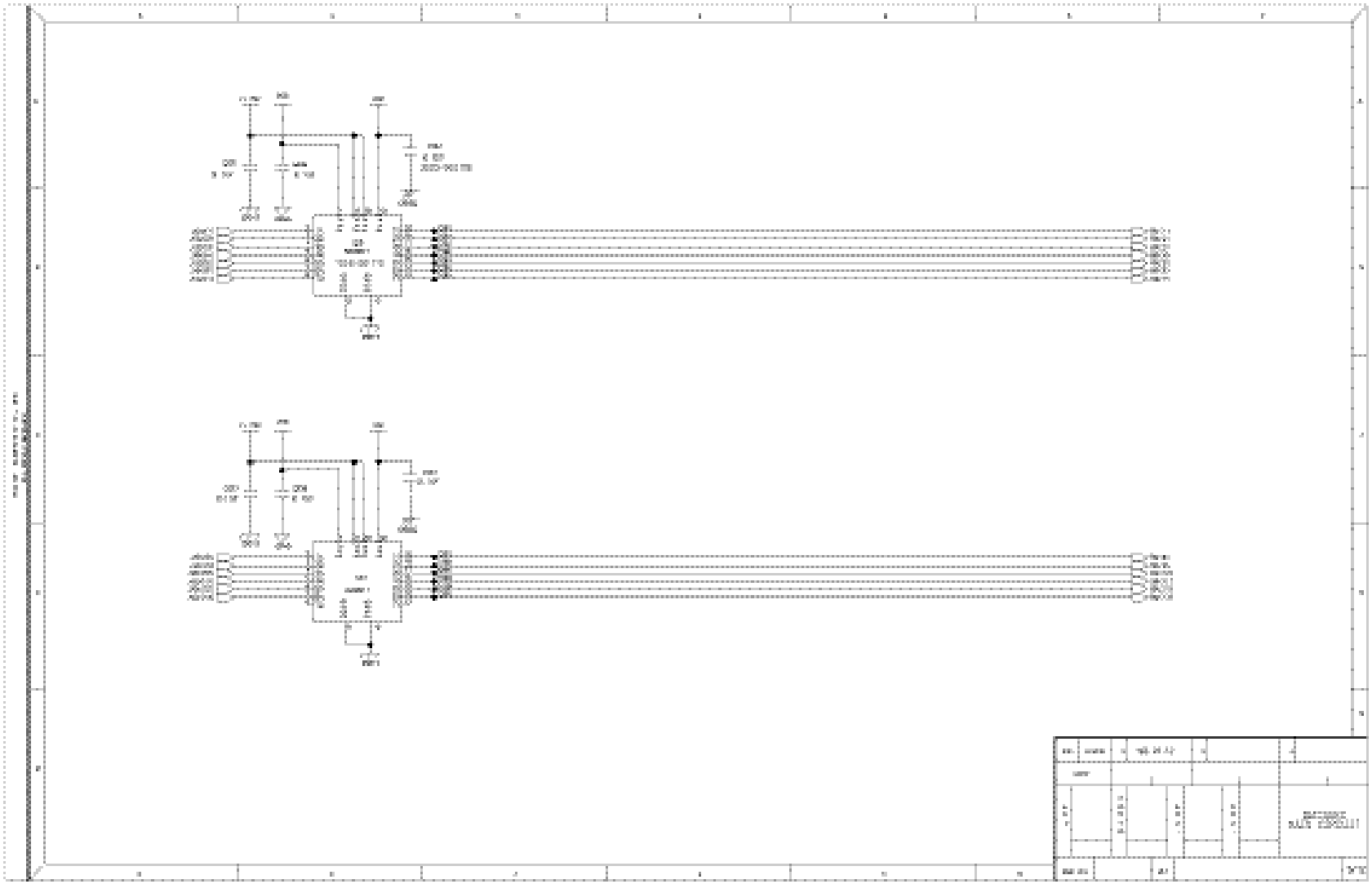


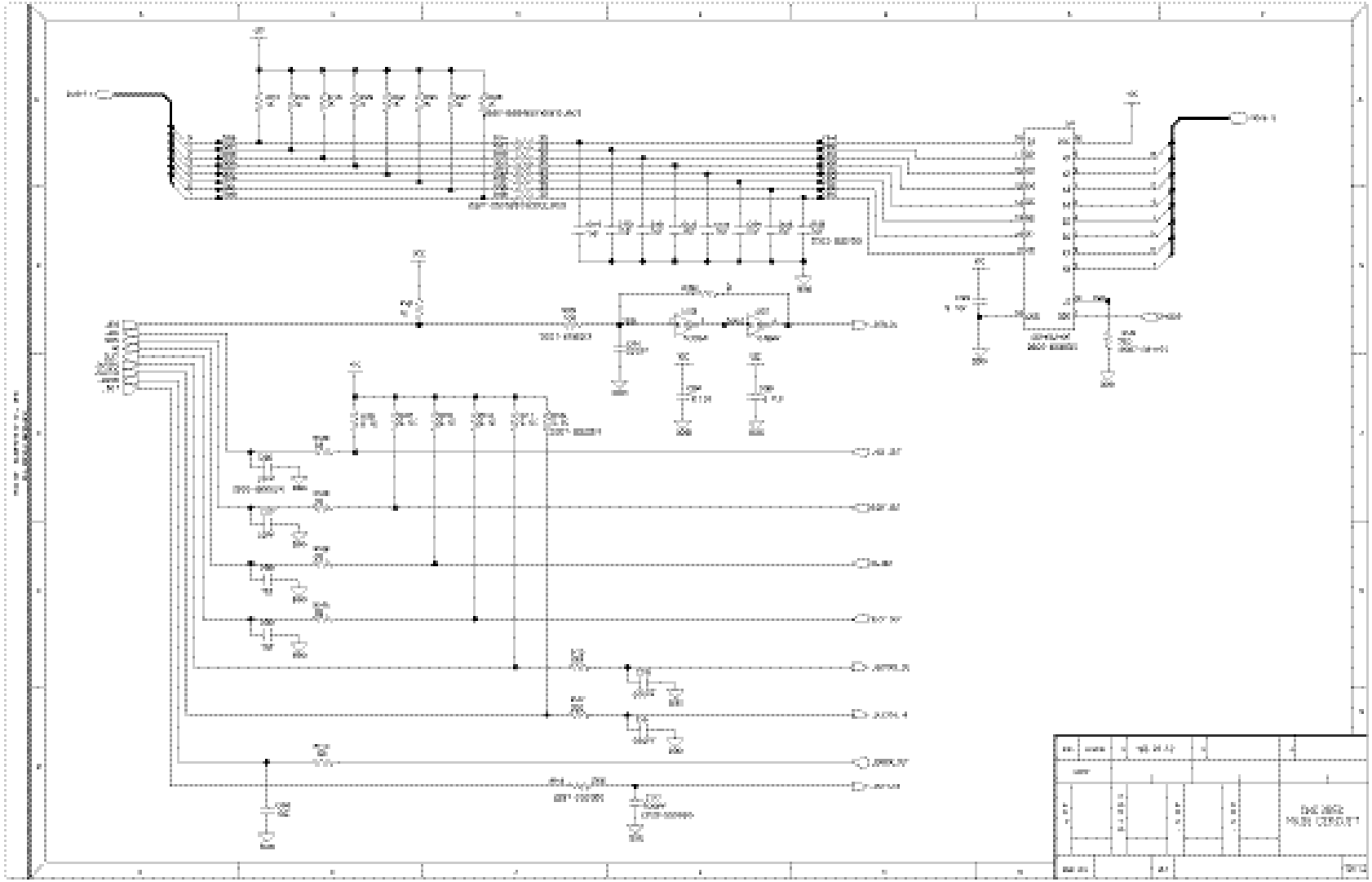


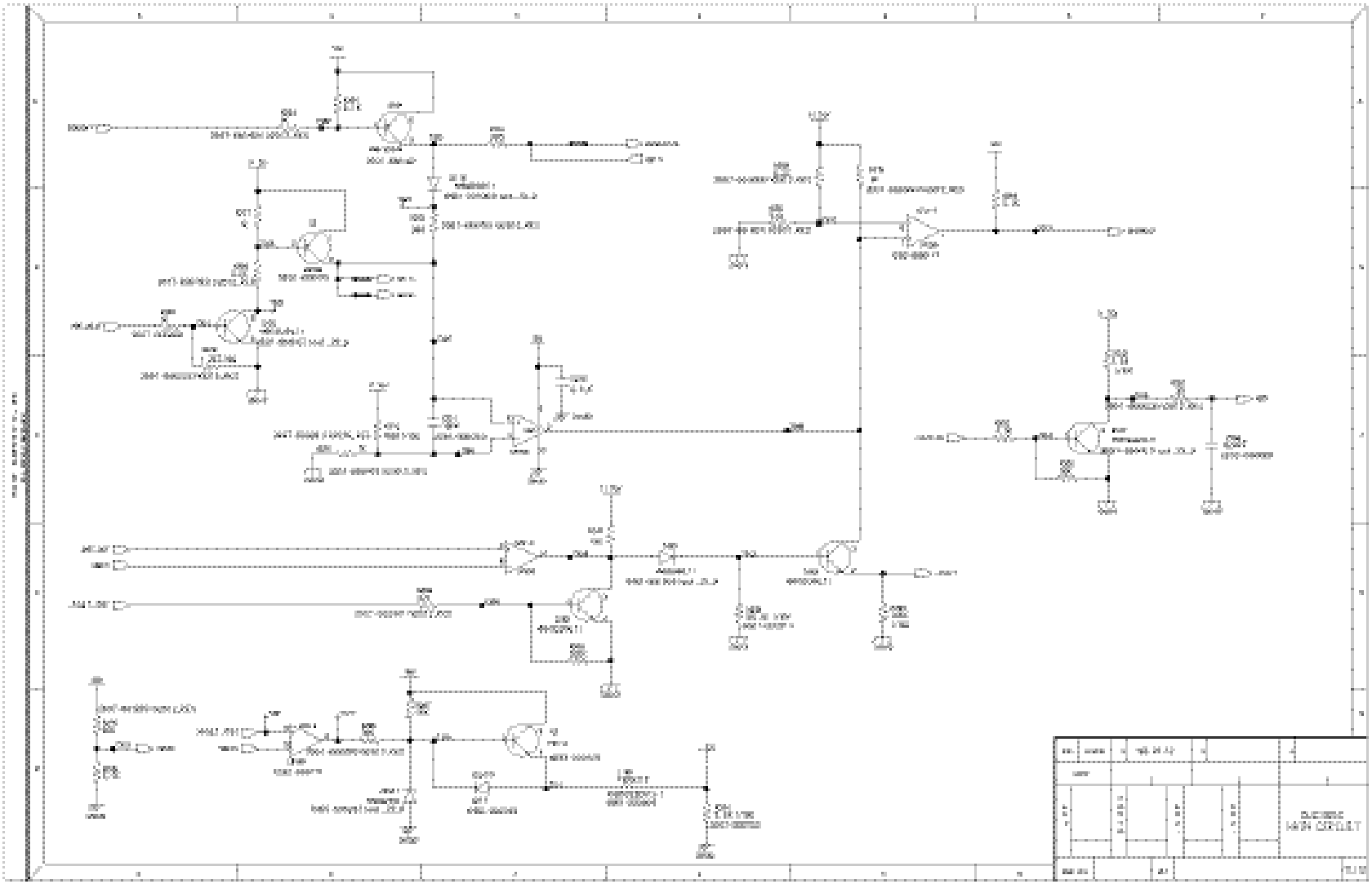


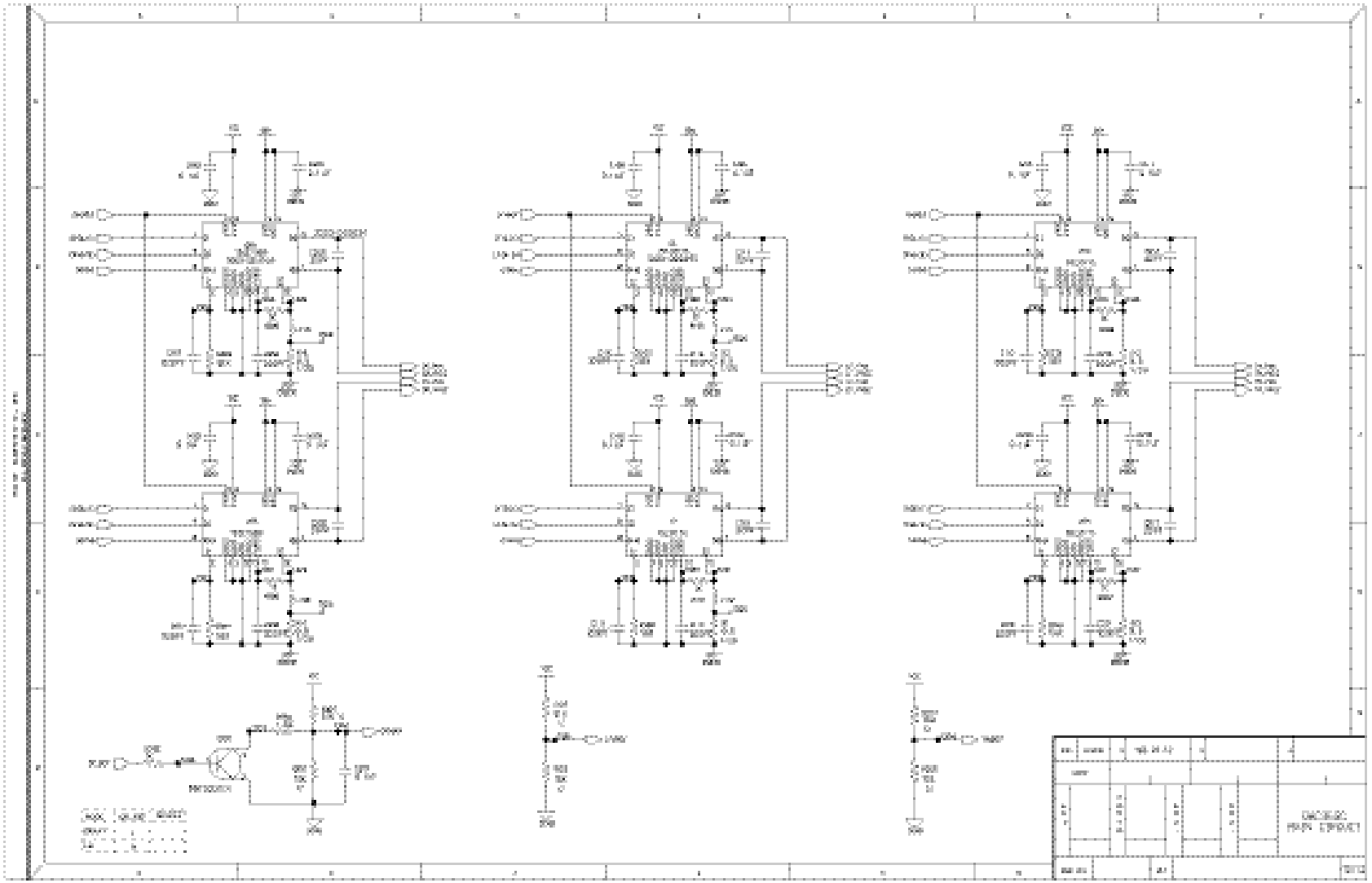


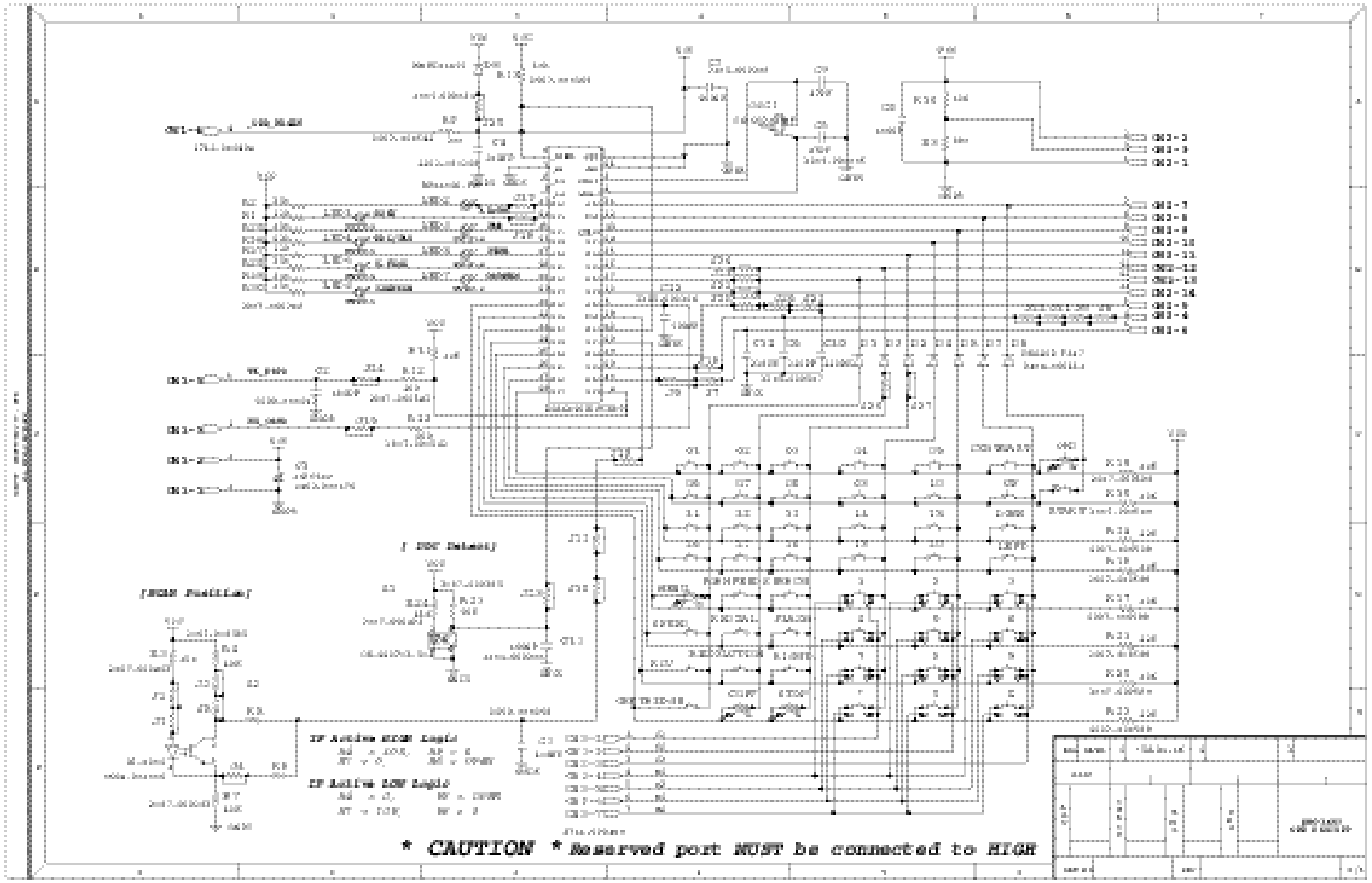











[DDC Select]
[RGB Position]
IF Active HIGH Logic
IF Active LOW Logic
* CAUTION * Reserved port MUST be connected to HIGH

5. List Abbreviations

Acrynym	Definition
MFP	Multi Function Peripheral
I/F	INTERFACE
UART	Universal Asynchronous Receiver/Transmitter
ECP	Extended Capabilities Port
CR	CARRIAGE RETURN
LF	LINE FEED
SCANIP	SCAN IMAGE PROCESSOR
CIS	CONTACT IMAGE SENSOR
A/D	ANALOG TO DIGITAL
D/A	DIGITAL TO ANALOG
LIU	Line Interface Unit
TIT	Transformer Input from Transformer
ROT	Receive Output Transformer
LI	Line Input

7. Theory of Mechanism

7-1 Scanner Mechanism

The scanner mechanism consists of components which feed, scan, and eject the documents that are to be copied or transmitted to a remote facsimile unit. These components and their functions are explained below.

7-1-1 Automatic Document Feeder (ADF) Mechanism

The automatic document feeder, consisting of various rollers, ADF rubber pad, and springs, automatically separates and feeds the pages of a document over the scanning area and stacks them on the document exit tray.

Documents up to 30 pages can be placed in the automatic document feeder for scanning. The leading edge of the document will move the document detect sensor lever when the operator slides the stack into the ADF. The scan motor starts to rotate when the document detect sensor has detected the leading edge of the document. The ADF roller feeds the first page of the document into the feeder.

The scan motor is stopped when the leading edge of the page actuates the document scan sensor. The page is now in the scan position.

The ADF rubber prevents multiple sheets from being feed. A spring provides forces that the pad places on the document pages for proper separation.

The scan motor is turned on when the machine is ready to scan the document and drives the feed roller at a speed determined by the resolution selected. The scan motor is stopped after a set period of time when the trailing edge of the page releases the document scan sensor. If another page is detected as the tailing edge of the page releases the document scan sensor, the next page will be fed to the scan position. The exit roller pushes the page out onto the document exit tray where it is stacked.

7-1-2 Contact Image Sensor (CIS)

The contact image sensor unit consist of LEDs, rod lens array, and a photo sensor. The LEDs illuminate the document to be scanned when the leading edge is detected by the document scan sensor. The LEDs turn off when the document exits the scanner mechanism.

The LEDs illuminate the document to obtain an image from the document through the rod lens array, where the image is translated into voltage levels.

7-1-3 Document Sensors

There are two document sensors in the scanner mechanism; the document detect and the document scan sensor. The document detect sensor, detects whether or not a document is loaded, and the document scan sensor detects the scan position of the document.

7-2-1 Paper Feed Mechanism

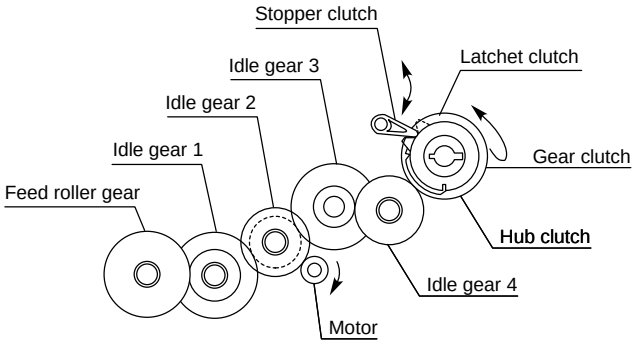
This mechanism consists of the automatic sheet feeder (ASF), feed roller ass'y, line feed motor, and gear ass'y to move the paper in and out of the printer.

When paper is fed in the printer, the line feed motor rotates briefly counterclockwise then regularly rotates clockwise to move the paper inside the printer.

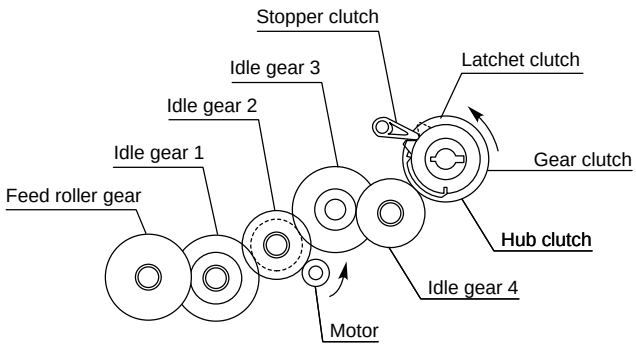
The stopper clutch transfers or interrupt power to the gear clutch according to the direction of motor rotation.

When a power is supplied to the gear clutch, it transfers the power to the pickup roller in ASF.

When the line feed motor rotates clockwise and power is transferred to the gear clutch, the power pulls the paper in the printer.



When the line feed motor rotates clockwise, the stopper clutch interrupt power so that the gear clutch is in idle state. The power is transferred to the idle gear and the paper is pulled in the printer and out of the printer.



7-2-2 Home Ass'y

When capping is released, the print cartridge carrier moves left and wipe the bottom of ink nozzle. After wiping it, the carrier rib pushes the rib in the dotted round as shown in the figure below. The home ass'y converts into standby mode.